FORWARD

This report was the result of a study conducted by the Commercial Support Sub Group, under the direction of the Aviation Logistics Board (ALB), with tasking from the Joint Aeronautical Commanders Group (JACG). The sub group was to examine impediments to the increased use of commercial practices and sources for military aviation systems.

The effort involved a number of personnel with representation from the Navy, Air Force, Army, Defense Logistics Agency, and the Aerospace Industries Association. Numerous studies, briefs, contracts, reports and other references were consulted during the development of this document. Additionally, many spokespersons were interviewed individually as representatives of their organizations and/or programs, and their assistance was most valuable.

The report contains a glossary of terms, a collection of lessons learned from the services, as well as the differences between the military and commercial environment, and an assessment of the implications of cultural, legal, financial, and operational considerations in formulating a commercial support program. The JACG considers this report to be a valuable source of information and a useful tool in implementing Acquisition Reform.

TABLE OF CONTENTS
COMMERCIAL AVIATION SUPPORT

EXECUTIVE SUMMARY 1-4

I. COMMERCIAL AVIATION SUPPORT ENVIRONMENT AND PRACTICES 5-17

II. COMMERCIAL SUPPORT OF DEFENSE SYSTEMS 19

1. Navy Programs 19-37
2. Air Force Programs 38-45
3. Army Programs 45-50
4. Defense Logistics Agency (DLA) 50-54

III. PERFORMANCE BASED LOGISTICS (PBL) 55-63

IV. ACQUISITION REFORM TOOLS AND TECHNIQUES 65-73

V. THE CURRENT BUSINESS RULES 75-84

VI. DETERMINATION OF CORE REQUIREMENTS 85-88

(4) **BARRIERS TO IMPLEMENTING COST EFFECTIVE AVIATION SUPPORT** 89-92

VIII. CONCLUSIONS AND RECOMMENDATIONS 93-96

IX. APPENDICES

A. Aviation Logistics Board Charter for Commercial Support of Aviation Systems Subgroup 97-98
B. Glossary 99-112
C. Acronyms 113-116
D. References 117-120
E. BCA Methodologies 121-126
F. Acknowledgements 127

JOINT AVIATION LOGISTICS BOARD
COMMERCIAL SUPPORT OF AVIATION SYSTEMS

EXECUTIVE SUMMARY

Despite growing recognition that commercial aviation support practices can provide benefits to the Department of Defense (DoD), the application of such practices has been limited. Based on this current state of affairs, in March of 1998, the Joint Aviation Logistics Board (JALB) chartered a working group to identify potential impediments to the application of commercial support practices to aviation systems and to develop recommendations to minimize or eliminate such impediments.

While the focus of this report is on commercial support, there is no presumption that commercial support of military systems is always more economical and effective than organic support. Rather, it acknowledges that when commercial support alternatives have been documented as preferable, through a sound business case analysis, there remains significant impediments to implementation.

The charter of this working group (Appendix A) was based on the premise that significant impediments to the implementation of commercial aviation support practices continue to exist. Among the potential key impediments identified in the charter were: the understanding of the expectations of contractor versus organic support; determination of the full cost for current support activities; common definitions of support and business practices; and the cultural, regulatory and legal barriers to the implementation of optimal policies in this arena.

In order to address these impediments and develop recommendations for resolving or minimizing these impediments, the charter assigned the working group the following tasks:

- Define key terms and initiatives relative to innovative logistics practices,
- Review existing policies and directives relative to commercial support of military systems,
- Review the Performance Based Business Environment (PBBE) processes for completeness in addressing commercial support and business practices,
- Review lessons learned from existing commercial support programs,
- Propose methodology for determining “full cost to the taxpayer” (regardless of the color of money), for the current organic approach,
- Identify barriers to full implementation of current policies, and
- Develop implementation guidance for approved recommendations.

The JALB focus on improving the application and scope of commercial support of aviation systems is driven by a growing concern regarding the death spiral that is a vicious cycle of deferred modernization driven by aging weapon systems, increased op tempo, reduced readiness, increased maintenance cost, increased operations and support costs which results in funding migration from procurement to operations and support. Faced with the challenge of stopping this cycle, civilian and military leaders in the defense community are looking for innovative approaches to logistics

support for legacy systems, as well as new systems, as a means to create savings through operations and support cost reductions that will ensure defense funds for maintaining readiness and achieving force modernization.

It is this theme of innovative logistics support as an avenue to help the department meet its aviation system readiness and modernization challenges that guided the JALB working group as it assessed the application of commercial practices to aviation systems. The working group did not view commercial support as a monolithic concept in its assessment. Rather commercial support for aviation systems was assessed in terms of three broad categories. These categories are:

- A transformation of how the department approaches logistics support, from a conglomeration of various support organizations driven by discrete functionally unique performance metrics to a performance based logistics philosophy designed and driven by specific warfighter support performance metrics;

- The development and implementation of a new approach to the business area of logistics for establishing business relationships with both organic and commercial providers, which builds upon the customer's requirements for performance based logistics utilizing a price-based approach to the acquisition of support products and services; and

- The establishment of new, innovative partnerships between DoD customers of logistics support, the internal DoD providers of support, and commercial providers. These partnerships should be designed to facilitate the implementation of performance-based logistics by leveraging the core competencies of each partner.

The JALB report is structured into eight major sections. The first section provides an overview of the commercial aviation support environment and practices. The JALB working group believed that, although the Department has been promulgating the application and integration of the "best" commercial business practices to defense operations, there has not been a clear definition of the commercial business environment, which they seek to emulate. In summary, the group found that the major differences between the DoD and commercial aviation support could be categorized into three major areas: approach, structure and metrics.

Approach: The commercial aviation environment promotes a proactive, evolutionary approach to support utilizing actual operating performance to drive and determine maintenance requirements. The DoD approaches support in a much more, upfront, deterministic way, with maintenance programs often more fully developed and more spare parts procured before the aircraft has much of an operational life.

Structure: The commercial aviation environment structures its support activities in a centralized fashion with one key executive having the responsibility for the support of the fleet. The functions that support the logistics mission are integrated by common objectives and clear lines of authority and responsibility. The defense community has a much more segmented and decentralized approach to aircraft support. Numerous organizations have responsibility for parts of the process, but ownership and responsibility for the life cycle support of the aircraft is not clearly defined and executed.

Metrics: Last but not least, there are differences in metrics. Commercial aviation utilizes a few discrete measures of performance that guide their support plans and programs. These metrics include maintenance cost per available seat mile or ton-mile, maintenance cost per aircraft and maintenance cost per flight hour. The data that supports tracking and evaluating those metrics is an integral component of their management information systems. The defense environment, while data rich, often has no clear concise mechanisms for measuring support performance.

The inability to easily and effectively link cost to support actions limits DoD's ability to use performance metrics to guide and structure its support programs.

The second section of the report illustrates the progress that DoD has made to date in implementing various innovative support concepts for aviation systems. In a series of twenty-one case studies, it is evident that some progress has been made in transforming DoD's traditional approach to logistics support. However, those that have achieved this progress, for the most part, have done so "in spite of" as opposed to "in support of" current business practices and incentives. Thus, the concept of performance based logistics was examined by the group and put forth as a philosophy to guide the transformation of logistics business practices.

The third section of the report provides a brief description and discussion of performance-based logistics support. The basis of performance-based logistics support is establishing logistics performance requirements driven by warfighter requirements and designing business relationships to incentivize meeting those performance requirements at the lowest total system ownership cost.

In the fourth section, various acquisition tools and techniques are discussed which offer potential mechanisms for implementing the logistics transformation to performance based logistics. However, many of the elements of acquisition reform tend to be targeted to new weapon system acquisitions, as opposed to support of existing systems. The issue of identifying the actual cost of DoD support operations is also addressed in this section. An approach to business case analysis is presented which utilizes a building block approach for the determination of DoD's current support costs. This approach to the identification of baseline costs is based upon DoD's cost allocation process for DoD activities funded through the working capital fund. The proposed approach specifically delineates those costs, which are allocated to products, and services that would need to be reduced or eliminated to achieve savings through the application of commercial support practices.

Sections five and six address the issues associated with DoD business rules for aviation support. The DoD and service policies and regulations for aviation support, in general, while they do not promote active pursuit of commercial practices, pose no serious impediments to DoD's implementation of commercial support practices. However, the Departments implementation of its core policy and methodology for the determination of its mission-essential depot maintenance requirements is not consistent. This inconsistency does detract from the department's ability to make strategic, long-term decisions regarding the best approach for meeting the goals of performance-based logistics support.

The seventh section of the report focuses on an identification of the barriers to implementing cost-effective support of weapon systems. This discussion includes legislative, regulatory, and cultural barriers. The eighth and final section provides conclusions and recommendations.

The major conclusions are as follows:

- The effective application of commercial aviation support practices to defense requirements requires a detailed understanding of the approach, structure and metrics of the commercial aviation environment which are significantly different than DoD's current approach.

- Performance-based logistics is a concept, which could serve as a strong foundation for DoD's transformation in logistics. The consistent and uniform implementation of this concept could improve operational performance, reduce cost and reduce cycle times.

- While some progress has been made in implementing innovative support concepts within various programs, the current weapon system program environment does not facilitate nor

incentivize such implementations.

- DoD's current implementation of its core policy and methodology is inconsistent and subject to frequent changes. This situation does not enable the development and implementation of support solutions that maximize performance and minimize the total cost of ownership.

- The concepts and policy tools associated with the Performance Based Business Environment (PBBE) for defense logistics offer a potential pathway for the implementation of performance based logistics.

- Legal, regulatory and cultural barriers exist which impacts the Department's ability to realize the full benefits of performance-based logistics support.

Based upon these conclusions and the supporting analysis, the working group makes the following recommendations to the Joint Aviation Logistics Board in support of commercial support of aviation systems:

- The Department of Defense and the Military Departments should undertake a planned transformation in logistics which is based upon the concept of performance based logistics support. As such, all providers of support, regardless of the organic or commercial nature of such support, are held to the same support concept and its associated metrics.

- The Department of Defense and the Military Departments, in their efforts to adapt commercial aviation support practices to the defense environment, should seek to develop a more comprehensive understanding regarding the support philosophy, structure and metrics that comprise the commercial aviation environment.

- The Department of Defense and the Military Departments should develop a new approach to the business of logistics for establishing business relationships with both organic and commercial providers which utilizes the premises and practices of a performance based business environment, including price based acquisitions, tailored to the concept of performance based logistics.

- The Department of Defense and the Military Departments should encourage and facilitate the development of innovative partnerships between DoD customers of logistics support, the internal DoD providers of support, and commercial providers. These partnerships should leverage the core competencies of each partner and clearly reflect specific roles and responsibilities of each partner in meeting specific logistics performance metrics.

SECTION I

COMMERCIAL AVIATION SUPPORT ENVIRONMENT AND PRACTICES

What is it and what does it offer to the defense aviation community?

INTRODUCTION

In this chapter, the definitions, concepts and practices of commercial aviation are presented and discussed. While the Department of Defense has been promulgating the application and integration of the "best" commercial business practices to defense business operations, there has not been a clear definition of the commercial business environment that they seek to emulate, where appropriate. In this section, commercial business practices are discussed in terms of commercial aviation support.

Commercial business practices may be defined as: techniques, methods, customs, processes, rules, guides, and standards used by profit-based organizations to achieve their business objectives. Generally, the profit motive encourages improvements in efficiency and effectiveness of the enterprise.

"Best" commercial business practices can be further defined as: A focus on safety and those business practices that have been demonstrated to maximize long-term profits while meeting or exceeding the customer's expectations.

The objectives of commercial aviation are driven by the profit motive. The objectives of military aviation are driven by overall national security requirements. The ultimate goal of "readiness" is shared by both commercial and military aviation, whether it be the aircraft "ready at the gate" for the airlines or the fully mission capable rate for the military. While it is recognized that the conditions of operation are very different for commercial and military aircraft, some of the business objectives for logistics are very similar. Both sectors hold safety as the number one, critical objective. The ability to obtain and exercise better control over the cost of aviation support is also a business objective shared by both sectors, given the commercial sector's focus on the bottom-line and the military's focus on maintaining readiness within shrinking budgets. Like the military, airlines operate out of a number of different airports and they must provide the aircraft at these locations with the parts they need. Airlines must periodically overhaul their aircraft and ensure that the repair activities get the necessary parts. The pipeline for both involves the purchase, storage, distribution, and repair of parts. Both the commercial and military aviation communities are dependent upon the aerospace elements of the industrial base ranging from the Original Equipment Manufacturers (OEMs) to suppliers at all levels and, as such, work in partnership with the industrial base to achieve optimal solutions to their support challenges.

1. SCOPE AND ENVIRONMENT OF COMMERCIAL AVIATION

A. The commercial fleet of aircraft is approximately 21,065, excluding general aviation aircraft, versus the military fleet of approximately 16,825. "Maintenance accounts for approximately 10% of an airline's employees and 10-15% of its operating expenses. Its mission is to keep aircraft in safe, working order, ensure passenger comfort, preserve the airline's most valuable physical assets (its aircraft), and ensure maximum utilization of

those assets by keeping planes in the condition they need to be in to keep flying.[1]" In 1997, maintenance costs for major and national airlines accounted for a total of $10.3 billion.

B. The commercial aviation support environment is based upon the business regulations and rules set forth in Federal Aviation Regulation (FAR), Part 43 and common business practices and guidelines that have been mutually developed and agreed upon by the airline industry and its suppliers through the Air Transport Association (ATA). Commercial aviation is also affected by Congressional oversight.

C. Regulations and Guidelines.

(1) FAA Regulations. The regulations for maintenance, preventive maintenance, rebuilding and alteration are provided in Federal Aviation Regulation, Part 43. The regulations in this section apply to all aircraft having an U.S. airworthiness certificate and airframe, aircraft engines, propellers, appliances and component parts of such aircraft. The scope of this regulation includes procedures for records of overhaul and rebuilding, the certification requirements for maintenance personnel, the inspection requirements, and disposition of maintenance records, performance requirements and airworthiness limitations. In addition, the regulations for continued airworthiness are provided in many parts of Title 14 of the U.S. Code of Federal Regulations. A portion of the regulations that provides some of the detailed requirements for maintenance, preventive maintenance, rebuilding and alteration is 14 CFR Part 43.

(2) ATA Guides and Specifications.

(a) The Air Transport Association (ATA) was founded by a group of 14 airlines in Chicago in 1936 and today, remains the only trade organization for the principal U.S. airlines. The purpose of ATA is:

"to support and assist its members by promoting the air transport industry and the safety, cost effectiveness, and technological advancement of its operations; advocating common industry positions before state and local governments; conducting designated industry-wide programs; and assuring governmental and public understanding of all aspects of air transport."[2]

(b) As such, ATA working with its members has developed and published a series of ATA guides and specifications guides. These are listed below:

- World Airlines & Suppliers Guide
- Maintenance Program Development Document (MSG-3)
- Common Support Data Dictionary
- AECMA Simplified English Guide for the Preparation of Aircraft Maintenance Documentation
- Guidelines of the Minimization of Foreign Object Damage (FOD) at Air Carrier Airports
- SPEC-100: Manufacturers Technical Data
- SPEC-103: Standards for Jet Fuel Quality Control at Airports

[1] "Airline Handbook" See Appendix D, reference #3, pg. 117
[2] "World Airline & Suppliers Guide" See Appendix D, reference #38, pg. 120

- SPEC-104: Guidelines for Aircraft Maintenance Training
- SPEC-105: Guidelines for Training & Qualifying Personnel in Non-Destructive Testing Methods
- SPEC-106: Sources & Approved Parts Qualification Guidelines
- SPEC-107: Visual Inspection Personnel Training & Qualification Guide for FAR Part 121 Air Carriers
- SPEC-109: No-Fault-Found Process
- SPEC-110: Master Minimum Equipment List Proposal and Coordination Process
- SPEC-300: Packaging of Airline Supplies
- SPEC-2000: Integrated Data Processing Materials Management
- SPEC-2100: Digital Data Standards for Aircraft Support

(c) The World Airlines & Suppliers Guide provides a framework for the roles and responsibilities of the airlines and their suppliers. The scope of this framework includes guidelines for: the special responsibilities of airframe and engine manufacturers; general terms agreements; provisioning; inventory policies; pricing; value analysis; order administration; packaging and transportation; invoicing; warranties; simulators; and manufacturers technical data. A few sections are especially noteworthy. For example, in terms of component maintenance and repair times, they state that the suppliers of repairable items should "demonstrate the reasonableness of the turnaround times they quote, which normally should not exceed ten working days, or an appropriate negotiated period."[3] In terms of delivery performance of suppliers, they state that "suppliers shall make every effort to ship AOG material within one hour of request and to ship other critical material within 24 hours."[4] Another common practice referenced in the guide involves a "buy back" provision which states,

"If airlines' surpluses are recognized after not less than one year from start of operation of new fleet and not longer than five years, and the quantities provisioned have been within the recommendations of the supplier, or within other mutually agreed provisioning rules, the supplier is expected to buy back such new and unused parts as established in the individual airline's GTA with the supplier."[5]

(d) Another section of the Guide delineates various types of warranties, such as a; standard warranty; ultimate life warranty; reliability guarantee; dispatch reliability warranty; maintainability guarantee; maximum parts cost guarantee; and a re-warranty of supplier repaired/overhaul equipment. One of the unique guarantees is the maximum parts cost guarantee, which is defined as suppliers are expected to:

1. Agree with the airline on a Maximum Materials Cost per flying hour (or other measure of usage) for maintaining, modifying, repairing or overhauling either:

   a. Designated areas (e.g. flight controls, engines) in the case of airframe and engine manufacturers; or

[3] "World Airline & Suppliers Guide" See Appendix D, reference #38, pg. 120
[4] "World Airline & Suppliers Guide" See Appendix D, reference #38, pg. 120
[5] "World Airline & Suppliers Guide" See Appendix D, reference #38, pg. 120

b. Individual items or equipment or systems in the case of equipment suppliers.

2. Reimburse the customer, either 100 percent of pro rata as may be agreed, when the actual materials cost for maintaining the equipment exceeds the guarantee.

3. Provide this parts cost guarantee for a minimum period of 10 years commencing with the airlines' first use of the product."[6]

(e) ATA SPEC 2000.

1. The ATA SPEC 2000 is a specification for standard formats to exchange information electronically between airlines and their suppliers and is specifically tailored to the airline industry's needs for procurement and repair transactions for aircraft maintenance. SPEC 2000 was developed in working groups of the airlines and suppliers over a period of approximately seven years. SPEC 2000 replaced ATA SPEC 200, which had been in use for 35 years. SPEC 2000 provides specifications for the exchange of both business and technical information between customers, manufacturers and suppliers by electronic message or magnetic media. Formats are defined specifically for the following material management functional areas:

- Provisioning
- Procurement Planning
- Order Administration and Invoicing
- Inventory Forecasting
- Repair Order Administration
- Repair and Overhaul Planning
- Bar Coding
- Surplus Inventory Sales and Purchases
- Warranty Claims Submission
- Aircraft Delivery Configuration

2. The SPEC 2000 initiative also includes three central data base activities. A Central Procurement Data Base, is a centralized electronic sales catalog which allows manufacturers and suppliers to list their sales information in a data base which is accessed primarily by the world's airlines to source aircraft parts. Airlines query the on-line database by part number to select sources that have the best possible price and lead time to meet their requirements. This data base provides internet access, viewing rights, strict security measures, a model of applicability that allows data that is not applicable to specific fleets to be filtered out, and variable pricing which allows the suppliers to list different prices for different customers. The mandatory data elements are: manufacturer code; part number; price or on-quote; price effective date; lead time; key word; currency code;

[6] "World Airline & Suppliers Guide" See Appendix D, reference #38, pg. 120

unit of measure; and lead time.

3. Another database of the SPEC 2000 initiative is the Airline Inventory Redistribution System (AIRS). This system is an international automated program for the sale and purchase of aircraft and engine excess parts and components. The database averages approximately 3.5 million line items of parts available for sale. ATA members report significant savings each year through both the purchase of parts and the sale of their excess parts through AIRS.

4. The third data base of the SPEC 2000 initiative is the Central Repair Data Base which allows authorized repair agencies to list their repair and overhaul information on a central file which is accessed primarily by the world's airlines to source repair services.

(3) Congressional Oversight. Congress through its constitutional authority to regulate commerce impacts the airline industry by establishing laws and regulatory agencies to ensure safety and competition. Two primary agencies established by Congress are the Department of Transportation (DOT) and the National Transportation Safety Board (NTSB). Within the DOT, there are two functions that are involved with commercial aviation. These are the Federal Aviation Administration (FAA) and the Office of Aviation Enforcement and Proceedings (OAEP) within the DOT Office of the General Counsel. Congress has also established laws that affect how airlines may compete. It has involved itself through the DOT OAEP in issues such as deregulation, reservation systems, gate access, pricing, safety, and others.

(a) **Role of FAA.** The FAA was established by Congress to carry out a two-fold mission: to promote air safety and foster air commerce. The FAA's primary responsibility is safety and affects the airline industry in the following areas of responsibility:

1. *Air Traffic Services.* The FAA provides the aviation community with three distinct types of air traffic services: controllers at Airport Traffic Control Towers (ATCT) and Terminal Approach Control (TRACON) facilities direct the safe and orderly movement of aircraft at or near the airport; controllers at Air Route Traffic Control Centers (ARTCC) oversee aircraft flying between airports under Instrument Flight Rules (IFR); and Flight Service Station (FSS) specialists provide flight planning, weather briefings, and other pilot assistance.

2. *Regulation and Certification.* The FAA's safety regulatory responsibility encompasses three primary elements: defining the rules and policies governing the design, manufacture, and operation of U.S. civil aircraft; certification of and overseeing commercial and cargo aircraft operators, aircraft and avionics manufacturers, maintenance organizations, pilot schools, and airmen; and monitoring compliance throughout the industry.

3. *Research and Acquisitions.* The FAA's research and acquisition programs are aimed at accelerating the pace of Air Traffic Control (ATC) system modernization, while advancing the frontiers of technology to achieve ever higher levels of safety, increase the efficiency of the system, protect the environment, and serve national aviation needs.

4. *Airports.* The FAA provides leadership in revitalizing and expanding the Nation's airport infrastructure. Implementation is aided by the awarding of airport grants-in-aid and approving the collection of passenger facility charges. These funding sources are used to improve airport safety, capacity, and security, and to reduce the adverse impact of aeronautical activity on the environment. The FAA also certifies airports serving air carrier operations and inspects these airports for compliance with established safety standards.

5. *Civil Aviation Security.* The FAA, in concert with the Nation's security, intelligence, and law enforcement agencies, continuously assesses threats against civil aviation, vulnerabilities at U.S. and international airports, and at critical FAA facilities that support the National Airspace System (NAS).

(b) **Role of NTSB.** The National Transportation Safety Board is an independent Federal agency charged by Congress with investigating every civil aviation accident in the United States and significant accidents in the other modes of transportation -- railroad, highway, marine and pipeline -- and issuing safety recommendations aimed at preventing future accidents.

2. CHARACTERISTICS OF COMMERCIAL AVIATION SUPPORT

A. ***Structure***.

(1) Commercial aviation support can be categorized into three types of activity: (1) maintenance base, (2) major maintenance stations, and (3) maintenance stations. The maintenance base is typically one facility that performs major maintenance work and aircraft modifications. The major maintenance stations are slightly less sophisticated and the facilities are located at an airline's major hub or primary airports. These stations perform most of the routine maintenance and stock a supply of emergency spare parts. The third level of support is based at airports where a carrier has extensive operations, although less than at its hubs. These maintenance stations perform some inspections and perform repairs, as needed.

(2) According to a recent LMI report, the commercial airlines employ a workforce of approximately 62,000 and maintain approximately 2,800 maintenance stations and sources. In another review of commercial airlines, Coopers & Lybrand found that most airlines are structured with a highly streamlined chain of command for logistics with all logistics functions reporting to a vice president for logistics (sometimes known as "airline technical support"). The various logistics functions include sustaining engineering, line maintenance, base maintenance, inspection and quality assurance, and inventory management.

B. ***Sustaining (In-service) Engineering.*** The airlines understand the importance of sustaining engineering to the development and upkeep of cost-effective maintenance programs. United Airlines took the industry lead in developing a logistics concept that has come to be known as Reliability-Centered Maintenance (RCM). This approach, first published in 1978, refers to a logical discipline for the development of a scheduled-maintenance program designed to realize the inherent reliability characteristics of equipment and to do so at minimum cost. The principles of RCM are focused on addressing three basic questions: (1) How does a failure occur? (2) What are its consequences? (3) What good can preventive maintenance do? In addition, the scheduled maintenance program must be dynamic which requires continual analysis of operating data throughout the life of

the system. The current principles and techniques for RCM are documented in an Air Transport Association publication entitled, Maintenance Program Development Document also referred to as MSG-3.

C. ***Maintenance.*** Approved maintenance programs are developed for each new passenger aircraft prior to its induction into service. This program is developed by the OEM in partnership with the airlines and manufacturers through an Industry Steering Committee (ISC). FAA officials also participate in this process as observers. Various working groups comprise the ISC corresponding to major aircraft systems and identify through the application of RCM, the "maintenance significant items." The ISC then determines the maintenance requirements for these items and develops the recommended maintenance plan for the aircraft. The FAA Maintenance Review Board, then reviews the plan and its supporting documentation, identifies any necessary changes and ensures that they are made, and then approves the plan. The approved maintenance plan is then delivered to all airlines that acquire the aircraft. Any airline that seeks to modify the initial maintenance plan must obtain FAA approval.

D. ***FAA Quality Assurance System.***

(1) Airlines, manufacturers, and repair stations must be certified by the FAA in order for them to operate in the commercial aviation industry. Each type of certificate holder has a set of requirements that must be met. They receive thorough audits of their operations (facilities, processes, training, personnel, etc.) in order to be approved. In order to ensure compliance, the FAA will periodically audit a certificate holder. Also, FAR requirements are flowed down through the airlines and the aircraft manufacturers to periodically review the quality of the systems of their suppliers.

(2) The Code of Federal Regulations allows the FAA to designate private persons to act as representatives of the FAA Administrator. These representatives are authorized to issue airworthiness certificates and related approvals. Designees may be employees of airlines, manufacturers, or repair stations. A designated representative may issue airworthiness certificates for eligible aircraft and parts thereof including new, altered (modified), and repaired.

(3) This system permits a more efficient use of FAA resources while meeting the expanding certification needs of the aviation industry. The FAA assures quality through the designated representative system by placing focus on process reviews by the FAA rather than inspection.

E. ***Supply Chain Management.*** The commercial aviation sector, just as DoD, is very dependent upon a wide range of suppliers from various segments of the industrial base. The commercial sector's approach to supply chain management is driven by the desire to identify and grow partnerships with preferred suppliers.

F. ***Information Support.*** The commercial aviation sector's maintenance philosophy, RCM, requires continuous real-time data on the status and readiness of their aircraft and all its tracked components. Information support is the fuel that feeds their system that ensures the safety and availability of their aircraft, while maintaining a cost-effective support process.

G. ***Performance Metrics.*** The priorities of commercial aviation can be categorized into three major categories: (1) safety, (2) reliability, and (3) life cycle cost. Safety metrics include: fatal accidents per million miles flown and fatalities per million miles flown. Reliability metrics include: mechanical system performance, cancellation performance,

pilot-write-ups, and daily utilization. Life cycle cost metrics include: maintenance cost per available seat mile, maintenance cost per available ton-mile, maintenance cost per aircraft, and maintenance cost per flight hour.

3. AIRLINE ORGANIZATIONAL ROLES, RESPONSIBILITIES, AND PRACTICES

A. ***Operations.*** Most airlines have a vice president for logistics who manages and controls all logistics functions and reports directly to the chief operating officer or the chief executive officer. In many airlines, the logistics function includes the scheduling and managing of airline operations. In other words, the logisticians decide what aircraft will be flown to what locations based upon flying hours and maintenance considerations. The managers of all logistics functions usually report directly to the vice president in a very streamlined chain of command. The senior logistics executives may shift funding and resources from one function to another when requirements arise. These executives are evaluated based upon their success in achieving common support goals, including safety, reliability/availability and cost control. These shared incentives contribute to a cooperative environment in which in-service engineering, line maintenance and base maintenance work together to identify and resolve problems.

B. ***Support Units.*** The airline logistics organizations typically maintain their own internal procurement and inventory management capabilities. Some airlines have two separate functions for supply support. One organization projects, acquires and manages the material for which demand can be anticipated with a high degree of reliability. Another organization acquires material for unanticipated demand and utilizes a variety of mechanisms to quickly identify and obtain the required parts. This group has more flexibility in contracting and pricing and is driven by reducing the time an aircraft is down due to parts unavailability. The airlines also often maintain a high degree of reliability and accountability for their inventory assets. Some airlines keep track down to the accountable individuals for the last six or seven transactions of an inventoried asset.

C. ***Quality Systems.***

(1) Standards Development. The airlines work through organizations such as the Air Transport Association and various national and internal standards organizations to develop mutually beneficial standards. In addition, the FAA serves in an oversight role to ensure that the standards contribute to safety requirements.

(2) Standards Application. ISO 9000 is a family of standards that provides a framework for quality management and quality assurance. The commercial aviation industry promotes the use of ISO 9000 as a mechanism that contributes to maximizing aircraft support services and processes. The aviation industry has also developed a specialized derivative of ISO9001 for aviation production and maintenance applications. The specialized standard, AS9000, Aerospace Basic Quality System Standard, has been submitted for approval as an ANSI and ISO-recognized standard. As mentioned earlier, the ATA SPEC 2000 serves as a standard for the electronic interchange of supply data for procurement and repair transactions for aircraft maintenance.

D. ***Sustaining (In-service) Engineering.***

(1) Evolving OEM Inspection Requirements. While OEMs provide the airlines with the initial, recommended maintenance program, in-service engineering is responsible for modifying the program to reflect the unique airline's requirements and the actual

reliability of the airline's fleet. As such, the in-service engineering program seeks to increase or decrease inspection requirements based upon the demonstrated reliability. Any changes to the recommended maintenance program must be made in accordance with FAA regulations.

(2) Identifying "Bad Actors." The in-service engineering organizations monitor and analyze data from various sources, such as mechanic reports, pilot write-ups, OEM service bulletins, FAA directives and other operational reports to identify any negative performance or reliability trends. When problems are identified, a tiger team is often formed and in-service engineering takes the lead in developing the proposed corrective actions. These proposed actions could include, engineering modifications, changes to the maintenance intervals, the introduction of new tasks, or a change in vendor or repair materials.

(3) Maximizing Work During Scheduled Downtime. The scheduling of aircraft for specific flights and locations is often driven by the requirement for maintenance or checks and the availability of specific resources at the various airports. In the case of depot-level repairs, the time that the aircraft is out of service is utilized to its fullest. Tasks are scheduled to optimize the downtime. The scheduling and planning is such, that aircraft very seldom, if at all, miss their scheduled departure date. The accountability and incentives/sanctions are such, that every effort is meticulously planned to avoid any unexpected actions that cause delays.

(4) Importance of Tracking Items and Performance. The capability to implement Reliability-Centered Maintenance is dependent upon the accuracy and timeliness of operational fleet data. Every action on the aircraft is recorded and tracked. The value of this information is a well-recognized fact by all individuals who play a role in supporting the aircraft.

E. ***Maintenance.***

(1) Scheduled Maintenance Activities.

A-checks
Conducted at the line or maintenance station level approximately every 14-21 days and includes filters, checks, lubrication, servicing and any non-routines necessary. The A-checks typically require approximately 20 to 40 man-hours and is conducted within 8 – 12 hours.

B-checks
Conducted at the line or maintenance station level approximately every 60 days and includes A-check tasks plus any other items requiring attention based upon inspection. The B-check typically takes 40-80 man-hours and is conducted within 8 – 12 hours.

C-checks
Conducted at either the line or the major maintenance stations approximately every 12 – 18 months and can be viewed as an annual check-up that includes rigging, recalibration of major aircraft systems, restoration of cabin interiors, and all lower level check tasks. The C-check typically takes 2,000 to 5,000 man-hours and is conducted within 3 to 7 days.

D-checks
Conducted at the maintenance base approximately every 8 – 10 years and includes the overhaul of major components such as landing gear and engines, as well as structural

corrosion tasks. The D-check typically takes 20,000 to 30,000 man-hours and is conducted within 21 to 30 days.

H-checks
Conducted by some airlines at the maintenance base approximately every 2.5 to 4 years to address the corrosion issues associated with aging aircraft. This includes the timely restoration of expected corrosion zones such as galleys and lavatories. The H-check typically takes 9,000 to 12,000 man-hours and is conducted within 7 to 14 days.

(2) Maintenance Business Strategies.

(a) In 1997, the major and national airlines spent approximately $10.3 billion on maintenance of their aircraft. Of these costs, 49.8% was direct, 29.4% was burden and 20.8% was line-related. The break-out of the direct maintenance costs: for airframes -- labor - 19.3%, material - 19.2% and outside contractors - 17.3%, and for engines -- labor - 4.7%, material - 17.6% and outside contractors - 21.9%. (Source: ATA)

(b) The airline industry is developing leading-edge practices that are primarily focused on reducing the time and complexity associated with logistics pipelines. Airlines are radically re-engineering their logistics systems.

(3) In-house vs. Outsourcing.

(a) Most established airlines with existing maintenance infrastructure contract out only 10 to 20 percent of their maintenance workload. These carriers may outsource more of their component workload in the coming years, but are likely to forgo full scale outsourcing due to the need to fully utilize existing infrastructure and comply with labor agreements to maintain employment. In contrast, emerging airlines outsource virtually all heavy maintenance in order to avoid the cost of establishing and maintaining an organic infrastructure.

(b) Outsourcing airlines have moved away from time and materials (T&M) contracts in favor of warranty-based firm fixed priced (FFP) and power-by-the-hour (PBTH) arrangements. (In PBTH arrangements, the airlines contract for performance – number of takeoffs, flight hours, etc. – rather than for spare parts or repairs.) The use of warranty-based FFP and PBTH contracts reflects the desire of the airlines to increase maintenance cost predictability and shift financial risks to the service provider. These arrangements also allow airlines to reduce inventory costs and provide vendors with strong incentives to improve reliability. The vendor fixes whatever breaks for a fixed revenue stream. For the vendor and the airline, PBTH provides for a win-win relationship. Increased reliability means higher dispatch and utilization rates for the airline – more revenues and profit. The vendor is paid based on a utilization rate; therefore, if he can improve reliability it will mean fewer repairs and higher profits.

(4) Technician Training/Qualification. The airlines rely on utilization of FAA-certified technicians (e.g., aviation maintenance technician, repairman, repair station) for performing maintenance. People who are interested in entering the commercial aviation job market are responsible for obtaining their own certification training from a FAA-certified school. The FAA does not accept maintenance tasks unless certified technicians sign them off. The FAA can take “certificate action” as an ultimate penalty for malfeasance.

(5) Maintenance Data. Maintenance data for aircraft and components are maintained and provided to aircraft owner/operators on an ongoing basis. Due to the high level of training required for certification of maintenance technicians for commercial aviation, the level of detail required in maintenance manuals is less compared to military documentation. Increasingly data is being provided and updated digitally. For the Boeing 777, all manuals were provided concurrently with the delivery of the first aircraft. Also, maintenance data is being delivered with test and diagnostic tools integrated with the system.

(6) Inventory. Techniques have been implemented such as systems that automatically redistribute inventory when shortages arise, pooling assets among airlines, transferring inventory management responsibilities to third parties, information systems and distribution centers that respond within a few hours.

F. ***Supply & Support Chain Management.*** Leading commercial firms embrace effective supplier relationships as a core business strategy and build organizations with skilled people to carry out the strategy. They use a rigorous supplier selection process to create a strong supplier base that they can more effectively manage. They have established effective communications and feedback systems with their suppliers to continually assess and improve both their own and supplier performance. And, the firms foster an environment in which suppliers realize more significant contributions that are matched with significant rewards. Systems have been implemented that electronically link the airlines to their supplier base.

G. ***Supplier Base Reduction and Preferred Suppliers.*** Traditional competition based solely on price has given way to best value and preferred supplier relationships. Companies have found that having fewer suppliers is more manageable and cost effective. By sharing information, risks and rewards, companies working with fewer high performing suppliers on a long term basis can solve problems and reduce costs through continuous improvement more effectively and efficiently.

H. ***Long-term contracts.*** The airlines understand that long-term business relationships that serve to further their performance and cost objectives are beneficial. As such, long term contracts with the appropriate incentives and sanctions provide useful mechanisms to help nurture and grow mutually beneficial business arrangements. The longer the contract, the more a supplier will be willing to invest in serving their airline customers.

I. ***Warranties.*** A common business practice of commercial aviation is the utilization of warranties. The improvements in information technology have enabled very detailed tracking of aircraft parts. As such, the airlines are able to easily substantiate warranty claims for items that fail to meet the contractual requirements. The long-term impact of this capability is that suppliers will take actions to improve their products based upon the economics of warranty claims filed.

J. ***Information Support.*** The commercial airlines support the philosophy of Reliability-Centered Maintenance, which requires accurate and timely integrated data. In addition, many OEMs and vendors have established on-line technical data and support services to support their airline customer's requirements.

(1) Sources of Data. Most airlines have information systems that provide life cycle tracking of parts, aircraft system reliability performance and maintenance action recording. Many also have information systems that support their parts procurement

and technical data systems. The data which reflects the life history of the aircraft is gathered on a day to day basis through the aircraft flight logs and often transferred from the manual log to an automated information system which tracks the configuration and maintenance events for a specific tail number.

(2) Structure of Systems. All major airlines utilize ACARS, an airborne performance monitoring and data link system, to provide real-time transmission of system performance data from in-service aircraft directly to airline flight operations and maintenance control personnel.

(3) Accountability for Data Integrity. The issue of data integrity is essential to the operational and maintenance decisions that are made. As such, there is a high premium placed upon the accountability for the accurate and timely reports.

4. SOME BEST PRACTICES

- Corporate focus and culture
- Customer service is primary focus
- Measurements that are tied to customer service and corporate financial goals
- Top management champions of change with full authority to make changes
- Integrated pipeline management
- Performance measurements aligned with corporate goals
- Successful continuous improvement
- Use of third parties to reduce complexity and cost of pipeline
- Information technology
- Accurate information on amount, location, condition, and usage of inventory
- Real-time inventory data
- Extensive use of data systems to track and manage flow of parts
- Timely development and implementation of new systems
- Supplier partnerships, reduced supplier base
- Supply and support chain management
- Long-term contracts
- Performance-base contracting (power-by-the-hour)
- Best value-based decisions for in-house vs. outsourcing
- Supplier-operated local distribution systems to delay purchase of inventory until needed
- Digital maintenance manuals
- Timely update to manuals
- Reliable deliveries to customer demand
- Reduction in layers of inventory
- High fill rates
- Reduction of just-in-case inventory
- Repair to need, not to stock
- Cellular process, fast turnaround times

- Availability of parts when required for repairs
- Reliability-Centered Maintenance
- Systems that track part consumption and failure data for analysis for reliability improvement
- Facilities reflect new business practices

5. SUMMARY AND FINDINGS

There are some similarities and differences between DoD and the airline industry in their approach, structure, and metrics to accomplish their respective missions.

A. ***Approach.*** The commercial aviation environment promotes much more of a proactive role in aircraft support than the defense environment. The former approaches the support of aircraft in much more of an evolutionary manner while utilizing actual operating performance data to drive and determine the evolving maintenance requirements. The latter approaches the support of aircraft in a much more upfront deterministic manner with maintenance programs often developed and spare parts procured before the aircraft has much of an operational life.

B. ***Structure***. The commercial aviation environment structures its support activities in centralized fashion with one key executive having responsibility for the support of the fleet. The functions that support the logistics mission are integrated by common objectives and clear lines of authority and responsibility. The defense community has a much more segmented and decentralized approach to aircraft support. Numerous organizations have responsibility for parts of the process, but the ownership and responsibility for the life cycle support of the aircraft is not clearly defined and executed.

C. ***Metrics.*** The commercial aviation environment utilizes a few discrete measures of performance that guide their support plans and programs. These metrics include maintenance cost per available seat mile, or ton-mile, maintenance cost per aircraft and maintenance cost per flight hour. The data that supports tracking and evaluating these metrics is an integral component of their management information systems. The defense environment, while data rich, often has no clear, concise mechanisms for measuring support performance and cost. The inability to easily and effectively link cost to support actions limits the defense community's ability to use metrics to guide and structure its support programs.

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SECTION II

COMMERCIAL SUPPORT OF DEFENSE SYSTEMS

How was it designed, and implemented and what did we learn?

INTRODUCTION

The services have some significant experience with a variety of commercial support programs. The experience on these programs can be instructive in deriving commercial support approaches; impediments, benefits, and lessons learned. Each of the programs addressed in this section adds to our knowledge base on commercial support of aviation systems. By definition, each of these programs reflects a point in time perspective and more current information will be continually available. A common thread in successful programs is the necessity that the services retain sufficient oversight of service certified products to ensure that delegated contractor support is accomplished in a manner that safely sustains flight worthy certification of the product.

Attempts at importing some of the commercial practices described in the previous chapter have met with varying degrees of success. In this chapter, the experience of selected service programs has been summarized. The DLA Virtual Prime Vendor Program has provided significant insight in supply chain management. The Navy's V-22 engine program has developed a power-by-the-hour® exploiting the commonality with commercial engines. All of the services have found that a partnership or teaming relationship with industry has produced favorable results. On the other hand, in general, the government has had mixed success with warranties (the ARC-210 radio is an exception). True long-term contracts have been virtually non-existent. In other areas, such as digital technical data, the services are making rapid progress. While adoption of commercial practices has been an extremely slow process, the programs described below have demonstrated that it can be done successfully, but not easily.

1. NAVY PROGRAMS

A. *T45 Training System (T45TS)*

(1) Program Description. The T45TS is the Navy's fully integrated strike pilot training system that includes: T-45 aircraft; aircraft simulator suites; academic materials, training aids, and equipment; a computer based Training Integration System; Contractor Logistics Support of the entire system, and Training Integrated Management System (TIMS).

(2) Program Life Cycle Phase: production, fielding, deployment and operational support.

(3) Degree/Aspects Of Contractor/Commercial Support: Full Contractor Logistics Support (organizational and intermediate level maintenance, OEM off-site component repair, Contractor Depot Field Team, Integrated Maintenance Program, supply support, program management, depot repair, and administration).

(4) Program Successes With Regard To Logistics Support.

(a) Direct Maintenance Man Hours per Flight Hour have decreased (from original projection of 10 to five per hour) over life of CLS contract.

(b) Consistent 100% sortie completion rate.

(c) Structured and managed via a fully integrated training program team that includes all contractors and government representatives.

(d) Established On-site Contractor Depot Field Team has significantly reduced modification install times.

(e) Established On-site Integrated Maintenance Program resulting in reduced cost, pipeline requirements and turnaround time as compared to traditional scheduled depot level maintenance.

(f) Stable and experienced workforce afforded by CLS has tempered experience shortfalls found in military maintenance organizations.

(g) Partnership with prime (sole source CLS award) has provided stability and sound business relationship for CLS management during configuration establishment. Once stable operations are achieved, the requirement should be competed.

(5) Program Shortcomings In Regard To Logistics Support.

(a) Reliance on baseline Hawk R&M data for spares forecasting early in program resulted in inadequacies in both range and depth of spares.

(b) Limited government/independent oversight resulted in purchase of commercial equipment when government equipment was available at substantially lower cost.

(c) Failure to acquire sufficient technical data as part of acquisition strategy. This forces a connection to the prime contractor for life, with attendant effects on competition flexibility.

(6) Impediments Encountered.

(a) Initially, single year contracting was required since final system configuration had not been achieved requiring repeat man hour expenditure.

(b) Customer insistence on Naval Aviation Maintenance Program organizational requirements may impede cost reduction - Navy's maintenance philosophy requires greater skill specialization than most commercial maintenance activities.

(c) PCFA/Contractor relationships as part of effort to establish government oversight has forced management burden on program office to resolve conflicts.

(7) Recommendations.

(a) Government/Contractor tailored R&M LSA process is required to facilitate an analysis of baseline platform differences to ensure adequate forecasting of all logistics requirements.

(b) Current Navy approach to contract oversight (at operating base) relies on ACO. Recommend establishment of dedicated technical government oversight at operating base.

(c) Provision of plant property as GFE (tools, furnishings, vehicles, etc.) ensures consistent quality of maintenance quality.

(d) Screen government excess property for use as GFE provision to contractor.

(e) Use Spares Integrated with Production procedures to purchase spares.

(f) Maximize the use of multi-year contracts for CLS to reduce annual renegotiations requirements (requires alternatives to the O&MN one year contract funding limitations).

(g) Initial Contractor Logistics Support operations should remain with the Prime Contractor until stable operations are achieved (operational site activation and aircraft configuration).

(h) Establish program for crash damage repair (SE, maintenance philosophy, etc.).

(8) Conclusions.

(a) T45TS CLS program is fully successful. Long term partnership with prime contractor has provided stable high quality workforce during system configuration development.

(b) Government oversight is critical to ensure establishment and achievement of program goals.

B. ***E-6A/B***

(1) Program Description. 16 E-6A/B aircraft performing two major strategic missions, Airborne Strategic Communications for deployed nuclear forces and the World Wide Airborne Command Post mission with the capability to launch ICBM. E-6 is a derivative of the 707-320 aircraft with 4 CFM-56 Turbo-fan engines. The mission suite includes High Power Transmit Set and two trailing wire antennas for VLF communications.

(2) Program Life Cycle Phase. E-6A deployed stable OPS/E-6B fleet introduction.

(3) Degree/Aspects of Contractor/Commercial Support. The contractor provides for parts support to Navy only. The Navy has determined that OC-ALC, an Air Force Depot, is the most economical source for maintenance. The Navy has developed a program called Enhanced Phase Maintenance (EPM) where OC-ALC performs depot maintenance concurrent with the Navy performing phase maintenance.

- End-to-end inventory management of all airframe flight deck avionics components
- On-call special engineering support
- Field service support
- Contracting for repair of all repairable components
- Inventory level management
- Replenishment of consumables
- Serial number tracking
- Cost control

- Physical space management (warehouse and offices)
- Subcontractor management
- Vendor qualification.

(4) Program Successes with Regard to Logistic Support.

(a) Government/ Contractor partnership,

(b) All efforts to achieve most favorable result for program at best documentable cost,

(c) Non-adversarial relationship, wide open for business,

(d) Sustained level of readiness at or above requirements,

(e) Major contractor influence with vendors improves performance by vendors (documented) not done with extra dollars,

(f) Rapid response at fleet sites and deployed, less than one hour average delivery at squadron, ~ 24-48 hours for deployed aircraft,

(g) Long range planning for long term gain,

(h) Minimum inventory because TAT managed,

(i) Process accuracy,

(j) Fills the need,

(k) Little to no overshoot on requirements,

(l) Processes developed by the level affected (i.e., a process for the warehouse is developed by warehouse people),

(m) Flexibility with speed (expand or contract as needed when needed), and

(n) Healthy airplanes,

(5) Program Shortcomings in Regard to Logistic Support. Tendency to overreact to fleet requests.

(6) Impediments Encountered.

(a) FAR interpretation - no common interpretation between attorneys, contracting officers, and services,

(b) Contract limitations,

(c) Rules established to ensure government jobs are sustained regardless of performance,

(d) Dangerous to plan for long term because of instability of funding, and

(e) Unwillingness by majority of government/industry to explore improving process.

(7) Recommendations.

(a) Establish a mapping guide for programs to look at possibilities of process improvement.

(b) Train program leaders on how to make a complete and comprehensive assessment of program support needs, regardless of the phase of the program.

(c) Establish the priorities in support, dollars, total value, quality, and safety.

(d) Do not force - contractors and government should be encouraged to work toward common goals and objectives. Government needs to understand the contractor's need for profit in business.

(e) Establish business courses for mid and higher management levels to employ with government business.

(f) Establish an area in which a return on investment can be realized.

(g) Employ prime contractors to assist in establishment of partnerships.

(8) Conclusions.

(a) Contractor Logistics Support (CLS) is not a bad thing when employed correctly.

(b) Costs can be minimized/reduced in terms of cost per unit of effort with long-term relationship and long range planning.

(c) The government manager using CLS can determine the outcome.

(d) Program support activities using CLS can be accurately measured in real time.

(e) True and actual support costs can be documented.

(f) Planning for best value is profitable, saves money, and is safe.

(g) Contractor Logistics Support can be employed to some degree on any program.

(h) Achievement of goals is possible in reasonable time using CLS.

C. ***ARC-210: AN/ARC-210(V) Electronic Protection (EP) Radio***

(1) Program Description. The AN/ARC-210(V) Electronic Protection (EP) Radio is a combination radio system capable of secure UHF/VHF AM/FM, and satellite communications (SATCOM) used in fixed and rotary wing aircraft, unmanned air vehicles, ground, and shipboard applications. It is a multiple service radio and has been incorporated for interoperability with the Air Force's HAVE QUICK (HQ) and the Army's Single Channel Ground and Airborne Radio System (SINCGARS) waveforms. The ARC-210 was developed by the Navy as an Engineering Change Proposal under the AN/ARC-182 contract N00019-84-C-0128, modification P00003. The EP Radio reached Milestone III July 1994, with 4,570 Radio-Transmitters procured through 1 February 1998. Initial Operating Capability (IOC) was established 31 October 1994 on F/A-18 aircraft. This AN/ARC-210 AP/ASR supersedes AP/ASR

95-06N and covers the new management philosophy and processes necessary to procure the remaining fiscal year (FY-98) through FY-03 requirements. The EP Radio is an organizational-to-commercial depot ("O"-"C/D") maintenance philosophy. Presently, intermediate level maintenance is only a test and check scenario and is being phased out between January 1999 and June 2000.

(2) Program Life Cycle Phase. Production, Fielding, Deployment, and Operational Support

(3) Degree/Aspects of Contractor/ Commercial Support. Commercial Depot (CD) support with a FIVE-YEAR Reliability Improvement Warranty (RIW) to provide warranty repair of basic Receiver-Transmitters (RTs) programs (RT-1556, RT-1747, RT-1744, etc). A follow-on performance warranty (five-year from DD250) CD support was successfully negotiated for new RT procurements in the FY98 contract. Additionally, a NAVICP-P Repair of Repairable BOA is in effect to repair warranty exclusions and other non-warranty weapons replaceable assemblies.

(4) Program Successes With Regard to Logistics Support.

(a) RIW MTBF improvement from 1100 MTBF (projected for FY-2000) to present MTBF of 4000 hours (FY-1998).

(b) AVDLR UNIT (Receiver-Transmitter) costs have decreased from $10,000.00 to $640.00.

(c) Interactive Training System (ITS) developed for AN/ARC-210 equipment to reduce A799 rate.

(d) Partnership with prime allows RIW warranty to reduce parts obsolescence/infuse technology changes without ECPs.

(e) Depot turnaround time is 23.8 days vice 30 days. Express shipment is 1.3 days in CONUS vice 5 days.

(f) Presently, express shipment is 1.3 days in CONUS vice 5 days.

(g) FIVE-YEAR warranty from DD250 on Receiver-Transmitter (only) on new products in contract.

(h) AIR-3.0 advocacy overcame old paradigm while fostering RIW development.

(i) Stakeholder /TYCOM buy-in made program successful, most of program risks shifted to contractor.

(j) Most of program risks shifted to contractor.

(k) As a result of RIW, Class 1 ECPs reduced; only Government Functionality Changes (P3I) drive ECPs.

(l) Interactive Training System (ITS) training module is reducing initial platform training challenge.

5) Program Shortcomings in Regards to Logistics Support.

(a) Challenges exist with coordinating O-level source data to ensure Platform Manuals (NATOPS/O-level) and Platform Training requirements are met.

6) Impediments Encountered.

(a) System was not ready to accept acquisition reform techniques (in FY-95).

(b) NALDA/LMDSS databases accuracy are unreliable/suspect at this time. Depot returns do not match fleet returns/MAFS.

(c) Multi-year contracting not available at the time of FY-95 Contract.

(d) Funding issue related to "color of money" of previous delivered RTs.

(e) Some initial resistance by supply community for express shipment because of departure from normal supply distribution.

(7) Recommendations.

(a) NALDA/LMDSS data and databases need management attention for fleet reporting via VIDS/MAF.

(b) Fleet buy-in of warranties/acquisition reform techniques paramount to success of program.

(8) Conclusion.

(a) AN/ARC-210(V) EP Radio Program is logistically successful. Acquisition and logistics costs are decreasing. Government and contractor IPT and partnering have produced high quality product and lowered cost of ownership.

D. ***Carrier Aircraft Inertial Navigation System (CAINS)II***

(1) Program Description. First Navy standard CAINS carrier capable used on F-18, F-14, E-2, S-3, AV8B, and C-2. Over 1,000 units are in service. Direct tie-in with GPS. Interchangeable with AN/ASN-130A. The system is still in production with about 300 to go. About 900 aircraft are presently flying with the CAINS II.

(2) Program Life Cycle Phase. In production.

(3) Degree/Aspects of Contractor Commercial Support.

(a) The reliability requirement was 2300 hours after 5 years operation; the actual measured value after 5 years was almost 6000 hours.

(b) The contract gave Litton the capability to upgrade the system through engineering changes and to develop and disseminate training information.

(c) All efforts are to be accomplished within the contract funding. Only damage repairs are over and above the contract funding.

(4) Program Successes With Regard To Logistics Support. High reliability, technically advanced systems and costly support equipment combine to show benefits in an Organizational to Depot maintenance concept. Enables reasonable spares level.

(5) Recommendations. NAVICP funded the follow-on repair contract on the basis of the number of repair, engineering and logistics people on the program. This value is adjusted each succeeding year based on the preceding years-actual experience.

(6) Conclusions. Flight line handling and shipping damage has caused units to be out-of-service for long periods of time and has incurred an additional $400,000 in costs for FY98. About 19 units per year are in this category. We have not completely solved this problem as yet but are working on it.

E. ***H-3***

(1) Background. Beginning in 1994, the H-3 began to transition to commercial support in various ways.

(a) In August 1994, Chief of Naval Air Training (CNATRA) awarded a contract for operation of the Aircraft Intermediate Maintenance Department (AIMD) at NAS Pensacola. All NAS Pensacola aircraft, including H-3, I-level requirements are being processed under this contract.

(b) In November 1994, the depot support contract was awarded which allows the contractor to do the following: SDLM, crash damage/conditional repairs, manufacture “make at depot” source coded items, perform/conduct inspections and install modifications either at the depot or with field teams. The contractor performs component repair for NICP on individually specified items on a scheduled or as required basis. The contractor also may provide engineering efforts when ordered, to facilitate repairs and design airframe modifications.

(c) NICP has been awarding contracts for the overhaul and repair of H-3 components since 1995. Because the H-3 is a non-core aircraft, all component rework efforts are being transitioned from organic to commercial sources.

(d) Currently the PMA is working on a contract, which will be awarded for Organizational level support of the H-3 (and other) aircraft at NAS Pensacola. When this occurs, the only military involvement for these aircraft will consist of providing flight crews.

(2) Lessons Learned.

(a) Get the customer (TYCOM’s) involved up front during the identification of the requirements to ensure contractual coverage.

(b) Identify all sources of funding and ensure availability based on contract type and CLIN structure.

(c) Ensure qualified individuals prepare a complete SOW.

(d) Get the correct CDRL’s.

(e) Have good contract monitoring and oversight (ACO).

(f) Select a contractor with the resources and motivation to do a good job.

(3) Benefits. Benefits can be realized from commercial contracting if the above lessons learned do not need to be re-learned. CLS can be less expensive and provide as much or more readiness than organic maintenance. Recent history has also demonstrated that no capabilities or flexibilities are lost in times of crisis or during hostilities. The military no longer holds a dominant position over the commercial sector in the areas of communications and logistics support. Proper, well thought out contracts can provide us with everything we need for the H-3.

(4) Drawbacks. There are none that cannot be resolved with a good contract.

F. ***C-40A***

(1) The C-40A IPT within PMA207 is promoting an innovative maintenance concept unlike any other Naval aircraft. Granted, commercial support is nothing new. But purchasing a modified COT's aircraft and maintaining and supporting the aircraft as if the Navy is just another commercial customer is quite new. Knowing the competitiveness of the airlines, the C-40A IPT is actively seeking a maintenance and support activity (knowledgeable in the 737 business) that will best fit our needs.

(2) Boeing has developed a 737-700 series maintenance plan. They currently have been tasked to populate an airline maintenance model with maintenance planning data from this plan. The result of this process will drive out airline job cards (similar to MRC's) that reference maintenance manuals for scheduled maintenance; very similar to the Navy's phased maintenance approach. The difference between Navy phased maintenance and commercial maintenance checks are mostly the time intervals. Boeing has been able to design in reliability, maintainability, and supportability enhancements based on their user demands, without some of the design constraints that exist with typical DoD acquisitions. The result is less frequent scheduled and unscheduled maintenance.

(3) The C-40A will probably adopt the C-9 O to D maintenance concept since the O level infrastructure is already in place. The challenge is splitting the maintenance between O and D in a manor that does not disturb the integrity of the recommended airline scheduled maintenance products. An example of this would be mixing and matching tasks from different interval maintenance checks for the convenience of the O level maintenance activities. Lessons from previous programs have proven that these types of deviations cause considerable support problems and increase O&S costs.

(4) The C-40A IPT realizes that the aircraft will have some uniqueness in design and mission, however, we also believe that anywhere we deviate from the 737-700 commercial support philosophy, we can assume a cost. We recommend an approach that requires justification for every deviation. We also realize that a commercial approach may sometimes require relief from the OPNAV 4790 instructions.

(5) Other foreseen savings are in the logistics footprint. We propose commercial maintenance and operating manuals whenever possible as a part of the initial cost of the aircraft, along with training, tools and support equipment. We will identify deltas between what is provided at no additional cost to what unique requirements exist.

(6) We are hopeful that the fleet users will embrace this approach.

G. *V-22 Engine*

(1) Program Description. The AE1107C is a 6250 shaft horsepower turboshaft engine manufactured by Allison Engine Co. (AEC). Two Full Authority Digital Engine Control (FADEC) fly–by–wire technology AE1107C engines are installed on each V-22 aircraft. The AE1107C has been certified as a Commercial Item under FAR 2.101 and Section 10 U.S.C. 2464. The AE1107C shares a common engine core and high parts commonality with other members of the AE family of commercial engines. The family includes the AE2100 turboprop engine (military application on the C-130J) and the AE3007 turbofan engine (military application on the Global Hawk). Allison anticipates worldwide sales of the AE family of engines to exceed 14,000 engines. The V-22 is being acquired for service in the Marine Corps as the MV-22, the Air Force as the CV-22, and the Navy as the HV-22. The total engine acquisition, installs and spares, is approximately 1,080.

(2) Program Life Cycle Phase. The AE1107C is undergoing EMD flight-testing. The Low Rate Initial Production (LRIP) contract has been signed and LRIP production is underway. First LRIP deliveries are set for May 1999 while Initial Operational Capability is scheduled during FY-01.

(3) Degree/Aspects of Contractor/Commercial Support. The AE1107C Program will be maintained through a Power By the Hour® (PBTH is registered by Rolls Royce) contract with AEC. The key support elements are:

(a) The support system is a 2 level system with an organic Organizational Level and a commercial Depot Level. AEC performs all maintenance above the Organizational Level for engines/components and provides replenishment of all parts and components used at the Organizational Level. The contractor is responsible for parts and material for repair of engines/components above the Organizational Level.

(b) The contractor is paid a fixed dollar amount per each engine hour flown.

(c) The contractor will maintain each engine upon Government acceptance of the V-22 aircraft into which the engine is installed or, in the case of spare engines, post installation functional test of the engine and V-22 aircraft.

(d) Engines will be covered by a contractor warranty from production delivery until they become eligible for PBTH coverage as outlined above.

(e) The contractor will perform Integrated Logistics Program Management of the AE1107C. The contractor shall establish management controls to assure that the AE1107C production engine configuration reflects contractual requirements and that the Integrated Logistics Support program reflects the support requirements driven by the production design.

(f) The contractor shall maintain the Logistics Support Analysis Record Database for Organizational Level Maintenance. Commercial data will support maintenance and supply above the Organizational Level.

(g) The Government and contractor are jointly responsibility for determining appropriate sparing levels for engines/WRA’s/components.

(h) The contractor maintains maximum Configuration Control authority in order to keep

the engine configuration as close as possible to the commercial variant. The contractor has full authority for class 2 ECP's while the Government retains final authority for class 1 ECP's. The contractor is responsible for supply and maintenance actions required to maintain configuration control of engines/WRA's/components.

(i) The contractor will repurchase spare WRA's and components owned by the Government as a result of configuration changes, increased reliability or faulty sparing recommendations. The contractor will provide increased spares to the Government free-of-charge if the shortage is caused by faulty sparing recommendations or reduced reliability.

(4) Program Successes with Regard to Logistics Support.

(a) PBTH is expected to reduce Life-Cycle-Costs for support by over $500 Million.

(b) A 28% increase in engine readiness is predicted.

(c) Maintenance and supply funding is directly tied to Operating levels.

(d) Significant increases in engine Mean-Time-Between-Removals are expected by tying into the commercial marketplace.

(e) Maintaining a common configuration with the commercial airline fleet significantly minimizes technical obsolescence.

(f) Maximized contractor Configuration Management reduces costs by allowing the contractor to invest in production efficiencies that are capitalized across the entire market. The contractor's profit incentive will drive AEC to maximize MTBR and reduce the cost of manufacture and support.

(g) Up-front Government support costs are avoided. The Government does not need to heavily invest in Intermediate and Depot Repair facilities, tooling, equipment and spares.

(h) The Government avoided buying unnecessary technical data in exchange for technical data guarantees for future data if the contract ends due to contractor causes.

(i) Long-term support contracts reduce costs by allowing the contractor to capitalize infrastructure over longer periods. The contractor is able to build a more efficient support infrastructure in consonance with commercial support requirements. Reduced support infrastructure risk reduces the Government's costs.

(j) High commonality with commercial engines significantly reduces the cost to carry inventory. Inventory costs to support a system are not linear with the number of systems supported. AEC's increased costs to support 14,000 AE engines over 13,000 engines is insignificant when compared to the Government's cost if supporting a fleet of 1080 unique engines. The Government would be required to lay-in the entire range and depth necessary to support a unique engine whereas under PBTH, AEC will need to invest in only the marginal difference between 13 and 14 thousand engines. Inventory costs are shared with the entire market place instead of being borne wholly by the Government.

(k) The engine is FAA type certified. Certification allows high commonality with commercial variants of the AE family. Design, testing, manufacturing and in-service support benefit from Single Process Initiatives under the purview of the FAA. Navy certification of the engine and associated processes has been melded into a unified process with the FAA to avoid duplication of effort and to reach the lowest cost solution. FAA type certification allows use of commercial in–service support, replacement parts and Integrated Logistics elements. FAA supervision of repair stations eliminates the need to perform military supervision and certification of the repair process and products.

(l) 6 licensed repair stations are located around the world providing in-theater repair in all major theaters.

(5) Program Shortcomings in Regard to Logistics Support.

(a) Total reliance on the contractor for repair of engines/WRA's/components. This is mitigated by:

1. The contractor's series of 6 worldwide repair centers for the AE family of engines.

2. High commonality with the large population of commercial engines is a significant benefit for the Government. AEC's inability to meet commercial requirements has a much more immediate and drastic impact on AEC's business than would not meeting the Government's needs under a separate contract with a unique engine configuration.

3. The Government has substantial protection for termination due to the fault of the contractor.

(6) Impediments Encountered.

(a) Restrictions on long-term contracting.

(b) Funding policies do not facilitate a system that directly ties maintenance and supply funding to operating usage. A program with support costs linearly tied to the operating usage by contract should have the funding tied to operating usage also. In this case, the optimum funding policy would be to include engine PBTH funding in the OP-20.

(c) Core requirements, interpretations and prejudices are substantial barriers. The V-22 program withstood four months of Congressional and legal challenges, including a GAO audit, attempting to reverse the commercial support decision in the face of substantial predicted cost savings and readiness increases.

(d) Analytical tools and processes are not in place to facilitate the type of analysis required to evaluate support concepts with commercial applications. Traditional logistics analysis tools are intended to provide Government managers with the knowledge and capability to build Organic support systems.

(e) Cost analysis procedures do not provide methodologies to easily analyze costs. The sensitivity of Government cost data bases does not allow accurate cost analysis. Results can be easily misunderstood - analyses of Government support

costs only estimate a minimum base of the cost. Significant cost elements are under reported or missed entirely. Commercial support costs can be accurately analyzed because they are established in a contract. Errors occur when organic costs are directly compared to commercial support costs and the Government costs are assumed to be exact.

(f) Significant cultural prejudices must be overcome when introducing commercial support to Fleet/Field units.

H. *Avionics Repair Facility (ARF)*

(1) Program Description and Background. The Avionics Repair Facilities at Lemoore, CA and Cecil Field, FL were established in 1981 and 1984 respectively to provide interim support of F/A-18 avionics. The ARFs are funded by NAVICP and staffed by Boeing. The mission of the ARFs is to provide fast, high quality, low cost F/A-18 avionics repair and modification.

(a) Originally established to provide repairs until organically depot capable

(b) Proven to be reliable, efficient, cost-effective method of support

(c) Has now been in existence for 17 years

(2) Degree/Aspect of Contractor/Commercial Support.

(a) $9 million awarded as order on Boeing's ROR BOA in 1997

(b) Additional $800K provided to air stations for support (utilities, shipping, packaging, security, fire protection, etc.)

(c) Firm fixed price level of effort contract

(3) Program Successes With Regard to Logistics Support.

(a) Staffed by a stable workforce of engineers and highly skilled technicians, (i.e. very low turnover of personnel)

(b) Supported by an entire Boeing engineering division which provides on-call service as needed (Pipeline to Systems Engineering)

(c) Backed by an ARF supply support group (material control) to optimize delivery of repair parts (e.g. procurement of obsolete and long lead time components)

(d) Equipped with high throughput test stations.

1. Smart man, Semi-smart machine concept

2. System specific test stations

(e) Adept at providing maintenance support for newly deployed systems in advance of organic military maintenance capability

1. Co-located with user activities

2. APG-73 radar

3. An/AAS-38B targeting FLIR

(f) Ability to perform major modifications to avionics equipment (e.g. the ARFS performed 1,797 modifications in FY-96 through FY-97)

(g) Reliable source of real time repairable and consumable avionics parts usage and technical investigation expertise

1. Support engineering investigations

2. Support ISSRs and CIRs

3. Initiate/Track PQDRs

(h) Responsive to military priorities

1. Expedited repairs

2. Test/Repair and return

3. Foreign Military Sales (FMS)

4. NASA

5. China Lake

6. Form fit and function testing of second source components

7. Support of squadron activities

8. Modifications

I. *Auxiliary Power Unit (APU) Government/Industry Partnership*

(1) Program Description. Representatives from Allied Signal and the Navy have been developing a teaming agreement that may provide the foundation for a direct vendor delivery program whose goal is to provide APU equipment to the Feet in a better, faster, and cheaper manner. This type of total support program is a means for the Government to more efficiently employ its resources in this time of declining military budgets. The teaming concept has been authorized by congressional action as a means of combining skills from the Government and Private sectors as a better way of providing a quality product to the Fleet on time and within budget constraints. This particular effort focuses on the APU equipment for the following U.S. Navy aircraft: P-3, S-3, C-2, and F/A-18. Since this concept is new for both parties, it represents not only a means of better supporting APU repair, but it also may serve as a template for future teaming opportunities.

(2) Program Life Cycle Phase: Concept Exploration

(3) Degree/Aspects of Contractor/Commercial Support. Full contractor logistics support (Contractor Depot Field Team, Integrated Maintenance Program and Jointly determined "Best Repair Practices," Supply Support and Material/Forecasting Management, Joint Program Management, and Depot Repair).

(4) Program Potential for Success With Regard To Logistics/Engineering Support.

(a) Provide a guaranteed increase in reliability and availability of APUs for Fleet customers.

(b) Maximize Time-On-Wing.

(c) Manage APUs from a total life cycle perspective within a private/public team environment.

(d) Forecast and replenish engine materials/spares in a timely and cost effective manner.

(e) Enhance maintainability over the life of the contract.

(f) Sustain 200% surge capability for 6 months if/when necessary.

(g) Establish on-site Contractor Depot Field Team.

(5) Program Potential Shortcomings In Regard To Logistics Support. Because teaming arrangements are a new concept, neither party knows that it will work, that APU repair costs will decrease, that Reliability, Availability, and Maintainability will be enhanced, etc.

(6) Impediments Encountered While Evaluating Program Proposal.

(a) Numerous Navy Business Case Analyses (BCA) yield different results.

(b) Metrics to establish cost savings/avoidance varies across aircraft T/M/S.

(c) Legal definitions of 'Core Workload' and 'Commercial/Common Items' are subject to misinterpretation.

(d) Evaluating, implementing, and assessing Public/Private teaming arrangements across NAVAIR, Naval Depots, NAVICP, and DLA requires coordination.

(7) Recommendations.

(a) Develop a NAVAIR/NAVICP process or method to provide follow-on teaming assessment/evaluation.

(b) Prototype a teaming arrangement to realize all associated benefits.

(c) Establish a Navy-wide implementation process/plan for teaming proposals that encompasses/utilizes a single Business Case Analysis that illustrates impact on Total Obligation Authority (TOA).

(8) Conclusions. Although the APU/DVD proposal is still in its early stages of review, it offers potentially significant long-term benefits for the Navy; it may prove to be a strong teaming candidate to prototype. Bringing key Public/Private players to the same table to discuss teaming opportunities has been successful.

J. *J52-408A Engine Program*

(1) Program Description. The J52P-408A Engine provides propulsion and power service for the EA6B Prowler Aircraft which has the primary mission of Command & Control Warfare in support of joint service operations.

(2) Program Life Cycle Phase. The aircraft and engine programs are in the out of production sustaining support phase with retirement planned for about 2015. There are 123 EA6B aircraft with a desired PAA of 104 supported by 366 active J52P-408A engines.

(3) Degree/Aspects of Contractor/Commercial Support. A long term, 5 year, DVD NAV-ICP contract with Pratt & Whitney to provide main engine rotor repair at NAS Whidbey Island with contractor furnished material.

(a) A portion of the J-52 engine rotor repair will be performed at a contractor supported site located within NAS Whidbey Island.

(b) Repair will be in accordance with the depot repair manual for the engine rotors.

(4) Program Expectations With Regard To Logistics Support. Government/Contractor partnership.

(a) Pratt & Whitney will obtain and install required equipment for assembling and balancing rotors at the repair site, about $500K.

(b) Contractor will furnish material for repair support in order to meet rotor repair turn around time.

(c) The introduction of more durable material including improved designs will be accelerated by the partnering process with contractor furnished material.

(d) AVDLR costs for main engine rotors may decrease over all due to DVD process and reduced transportation and handling.

(5) Program Shortcomings In Regard To Logistics Support.

(a) Oversite should be retained by the Engine FST vice DCMC. All direction and decisions are made by the FST regardless; DCMC simply adds a layer of administrative delay.

(b) Oversite of the remote repair process will require in-service engineering and logistics resources from the FST. These resources are being reviewed along with other J-52 priorities.

(6) Impediments Encountered.

(a) Delays in Commerce Business Daily announcement occurred while resolving public

law and FAR applicability.

(b) Congressional concerns related to organic depot workload.

(c) Team had several discussions concerning contract strategy such as: 1) warranty type/length/cash benefit; 2) contract type: Commercial vs. Negotiated Procurement; 3) ILA format; and 4) contract length.

(7) Recommendations.

(a) Ensure that a complete Business Case Analysis (BCA) is completed early in the review process. Reach a consensus on who will be conducting the analysis early on so that redundant work is avoided.

(b) Account for all current management functions and determine where real savings/cost avoidance will be realized and identify how the functions will be performed under the partnering concept and who will perform them.

(8) Conclusions.

(a) Partnering can reduce the O & S cost for an out of production, fielded program during sustainment even when durability modifications are in process.

(b) The role of the inservice engineering team, FST, will become more critical with the addition of a commercial repair site as all individual component repair criteria, as well as the over all repair process, will be included in their responsibilities even if DCMC is included in the contract management.

K. *F414 Engine*

(1) Program Description. The F414 Engine is a low bypass turbofan engine, with augmented thrust provided by the afterburner. The engine consists of six modules as follows: 1) Fan, 2) Compressor, 3) Combustor, 4) High Pressure Turbine, 5) Low Pressure Turbine, 6) Afterburner. The engine is controlled by a Full Authority Digital Engine Control (FADEC) which controls thrust modulation, fuel delivery, and governing. Maximum thrust is 21,890 lbs.

(2) Program Life Cycle Phase. Currently in Low Rate Initial Production (LRIP) with the first 27 production engines delivered in FY98 and FY99.

(3) Degree/Aspects of Contractor/Commercial Support. The F414 engine work share concept is known as Government/Industry Logistics Support (GILS). GILS involves the Government performing all levels of maintenance with industry providing the majority of the logistics support, such as material management (parts support), training, support equipment, configuration management, etc. A GILS concept demonstration is planned for engine support during the aircraft OPEVAL phase. A long-term commitment to GILS is dependent on the success of the OPEVAL GILS demonstration. The current acquisition plan has organic support as the baseline logistics support with the GILS concept being investigated as a possible alternative.

- Initial and replenishment spares
- All repair material (O, I, and Depot consumables, Life Limited parts)and Depot Peculiar Support Equipment

- Training
- Technical Data
- Configuration Management
- In-Service Engineering
- Field Service Representatives
- Containers
- Continental United States Transportation
- Life Management
- R&M Engineering
- Maintenance Planning
- System Safety

(4) Program Successes with Regard to Logistics Support.

- Greater than 10% reduction in Operating and Support costs anticipated.
- Performed trade studies to determine most cost-effective support solution.
- Satisfies Title 10 Core Law.
- Validated partnering concepts by conducting a teaming conference with Industry and USN personnel determining "who does what best."
- Reduction in Intermediate level billets.
- Engine Availability guaranteed.
- Reduced DEPOT turnaround time.
- Business/Execution Plan developed documenting risk, schedule, workload split, and benefits.
- Maintains successful government functions.
- Provides additional workload to industry.
- Significantly reduces NAVICP/NAVSUP Surcharge.
- Metrics identified to ensure program success.
- Transparent to O and I-level maintainer.
- Contractor shares in risk and benefits during period of performance.

(5) Program Shortcomings in Regard to Logistics.

(a) Loss of NAVSUP/ICP surcharge revenue will force surcharge for remaining programs dealing with NAVICP to go up.

(b) Reduction in shore I-level billets, sailors may be forced to spend more time at sea.

(c) Ability to change and implement different incentives for the fleet maintainers to ensure their behaviors supports the new concept.

(d) If the GILS effort is not successful, the Government will face immense challenges in reverting to an organic approach.

(6) Impediments Encountered.

(a) NADEP and Industry's initial positions of wanting all the workload.

(b) Industry not sharing cost data to backup their proposal.

(c) Funding issues/contractual issues – In order to maximize the effectiveness of the program a single line of accounting provides the most flexibility. This presents significant challenges to make that come to fruition. Additionally, the ability to contract for extended periods of time (5 years) is not supported by all the team.

(d) Commitment by all the team to be open and honest about their expertise and the efficiencies of what they are proposing.

(e) Developing a cost analysis that both industry and the Navy would stand behind.

(7) Recommendations.

(a) Perform trades early on all potential alternatives to focus on those that provide the lowest cost, least risk, and are politically attractive.

(b) Once options are downs-elected, bring subject matter experts from USN and Industry to review each portion of the concept (transportation, supply support, pubs, etc.) and verify feasibility

(c) Identify risks and develop mitigation plans. Develop a POA&M to sell the concept and get approval.

(8) Conclusions.

(a) Partnering with Industry will allow you to pick and choose the strengths from USN and Industry.

(b) Partnering can increase workload at the DEPOT repair site.

(c) Partnering will incentivise the contractor to improve reliability, because the fewer inductions equates to profit.

(d) The USN must maintain visibility to contractors actual cost ($/FH) incurred during support period or will be at a disadvantage for negotiating the next contract.

(e) USN still must maintain visibility to key metrics (MEFHBR, $/induction, False Alarm Rate, etc.) to not get blindsided by contractor’s inability to meet contractual requirements.

2. AIR FORCE PROGRAMS

A. *C-17*

(1) Background.

(a) The C-17 program, when faced with the BRAC closure of their Depot, established a General Officer Steering Group (GOSG) to review the options for interim sustainment of the C-17. The GOSG recommendations included: implement engine CLS by Jun 97; continue current ICS until May 98; design and implement C-17 Flexible Sustainment Program (ICS+) NLT May 98; orderly transition into post-BRAC depot structure; create depot milestone decision in 2003 to reevaluate flexible sustainment; and implement depot decision NLT end of production in FY2005.

(b) In response to these recommendations, the C17 program office adopted a strategy to bridge the production phase & depot decision with alternatives other than a pure organic depot or a pure contractor depot. The strategy focused on Flexible Sustainment, which utilizes a Performance Work Statement (PWS) to contract for Interim contractor support. This Performance Work Statement covers five broad areas; describes service output requirements and standards of performance (15 objective measures); and focuses on performance outcomes associated with support. It also includes a contract surveillance plan, which covers the methodology to determine performance. The ICS provisions include maintenance/repair of aircraft; spares management data; on site personnel (engineers, tech reps, supply, QA personnel); and sustaining engineering and logistics.

(c) The engine CLS effort includes a commercial subcontract with Pratt & Whitney (P&W); original equipment manufacturer (OEM) support; propulsion system repairs/maintenance (off wing), including power plant overhaul and repair. The contract covers repair parts, disassembly/assembly of engines, repair of broken engine parts to include core engine LRUs removed by AF, rotable spares, and P&W program management labor costs. Propulsion system spares support (replenishment/consumable spares) and QEC kit repair are also included.

(2) The C-17 Flexible Sustainment contract was awarded to the Boeing Company effective 1 January 1998. The first period of performance ended in September 1998 and subsequent options will be awarded each fiscal year. The contract includes the CLS for the propulsion sub-system and the Flexible Sustainment for the remainder of the unique C-17 components. In all the Flexible Sustainment covers:

(a) Program management to execute all contracts requirements and support surge contingency/national crisis activity.

(b) Sustaining logistics support to organic Air Force maintenance, modification, and provisioning activities and the generation of associated data.

(c) Spares management and repair to support user and depot spares requirements for all C-17 unique Spares.

(d) Sustaining engineering effort to support user operations/support, weapon system requirements, and analysis to maintain airworthiness, mission readiness and system safety.

(e) Depot level aircraft maintenance (scheduled and unscheduled), planning, scheduling, and modifications to include O&A work.

(3) Performance evaluation is accomplished through the use of three elements.

(a) Performance Work Statement which defines performance based tasks to be performed by the contractor.

(b) Award Fee Plan which motivates the contractor's performance in those areas critical to program success (e.g., technical, cost, and other) and sets forth the process for evaluating performance.

(c) Surveillance Plan which measures and documents actual contractor performance consistent with Award Fee Plan.

(4) Lessons Learned. The lessons learned include Team Building, Management Planning and Decision Making.

(a) Team Building recommends the establishment of Integrated Process Team (IPT) early and collocation of personnel. Team membership should include, in addition to technical members, auditing functions (DCMC, DCAA), lawyers, Airstaff, and MAJCOMs. Team members need to be empowered to make decisions, determine level of buy-in necessary at each level of contract development (requirements, surveillance, special contract provisions, etc.). The continuity of teams through entire process is highly desirable and at major review/milestones need to avoid stovepiping of teams.

(b) Management Planning learning includes: develop ROM costs early; job analysis (tailor process to fit program requirements); and perform surveillance planning early (develop surveillance methodology in conjunction with determining metrics).

(c) Decision making lessons recommend: maintain good audit trail (NOTAM, minutes, etc.); obtain high level sponsorship, (the higher the better); and understand the closure criteria.

(5) Summary. The C-17 Program Office has a contract structured to meet and respond to user needs, motivate contractor to perform, and allow flexibility when implementing Agile Combat Support. The contractor performance is set forth in performance terms in the PWS, incentivized by the award fee plan and measured by the surveillance plan.

B. ***F-117***

(1) The Air Force, on 30 September 1998, awarded Lockheed Martin Skunk Works (LMSW) a sole source, Total System Performance Responsibility (TSPR) depot-level acquisition and sustainment weapon system support contract for the F-117 Stealth Fighter that provides stable logistics support into the next decade. This contract, beginning 1 October 98, continues the logistics support necessary to fulfill the weapon system mission, ensure combat capability and provide services presently performed by LMSW, breakout contractors and the System Program Office (SPO). This contract includes all support functions with the exception of Intermediate and Organizational maintenance.

(2) The original concept for F-117 was for a Contractor Logistics Supported weapons system with a small SPO to oversee necessary government functions. Accomplishment

of Program Management Responsibility Transfer (PMRT), in October 1989, moved the SPO from Wright-Patterson to the Sacramento Air Logistics command (SM-ALC). The ALC began the process of breaking out subcontractors and increasing technical oversight, generating considerable duplication of effort. All hardware, item management and distribution functions transferred to Sacramento creating a "third leg" in the weapon system support pipeline. SPO size ultimately increased to 226 providing sustaining management and contractor oversight.

(3) LMSW presently provides 75% of the core sustaining for the F-117. All technical support is conducted under the annual sustaining contract and individual upgrade programs. LMSW also operates the modification/depot line at Site 7, AF Plant 42. These core capabilities provide a solid foundation for effectively increasing the LMSW Program Management role. TSPR expands LMSW responsibilities in the areas of system engineering, material management, subcontractor management, system & subsystem support, direct support to the user and AF reporting requirements. The majority of tasks scheduled to transition from the SPO are items already performed at LMSW. Government responsibilities will continue to include program direction, requirement determination, contract management, business/financial execution, product/service acceptance and security. The SPO size is targeted to reach 55 people by the end of FY99 with a goal of 20 by FY01 as LMSW demonstrates support capability. The TSPR contract will return the F-117 to the original concept - Contractor Logistics Support with LMSW as the prime system integrator and a small SPO providing oversight capacity.

(4) F-117 TSPR offers an incentive package to assure performance while encouraging the contractor to reduce costs. The contract will have a 3% Award Fee provision for subjective evaluation of technical, management, subcontracting and customer satisfaction. Grading is based on input from all aspects of the government including the SPO, ACC, the 49th Fighter Wing (FW) at Holloman AFB, DLA and DCMC. A 7% Incentive Fee provision based on seven performance metrics will track Non-Mission Capable Supply, MICAP rates, Readiness Spares Provisioning (RSP) Kit fill rates, Depot Quality, Depot Delivery, Delinquent Deficiency Reports and Weapons System Trainer Availability. All items are currently tracked by the 49th FW and SPO and are considered the most important indicators of program support. Finally, TSPR provides for 50/50 cost share between the government and LMSW on any under run with no ceiling. A minimum performance of 50% on metrics is necessary to receive any additional fee. Overruns are also shared 50/50 to the maximum of the Award and Incentive fees combined.

(5) F-117 TSPR has been identified as a pilot program for the Air Force and DoD. This small fleet of 52 aircraft, located at a single operating location at Holloman AFB, offers a unique opportunity for the Air Force and LMSW to continue the F-117's excellent program health. Timing for this transition is optimum due to the BRAC decision to close McClellan AFB, current location of the F-117 SPO. LMSW, as system integrator, will compensate for anticipated SPO program experience loss and complement a significantly downsized SPO with resident expertise. TSPR represents a departure from "business as usual" as it allows LMSW the flexibility required to manage sustaining funds, as appropriate, over the eight years of the contract with no degradation of the total program support posture. The contract makes LMSW accountable for complete weapons system support. TSPR challenges the company to provide support to the 49th FW that is "equal to or better than" current levels while reducing Total Ownership Cost to the US Air Force.

(6) The F-117 program is the Air Force's most complete application of Acquisition Reform initiatives and is successfully being operated with reduced government oversight. The program was implemented with a significantly reduced Air Force support capitol investment. The commitment of the Air Force to a long-term supplier relationship has allowed for optimal contractor investment.

C. *B-52 Re-engine*

(1) Background.

(a) In June 1996, Boeing provided a proposal to the U.S. Air Force for re-engineering of the B-52H aircraft with modern commercial-off-the-shelf (COTS) turbofan engines and a COTS on-board auxiliary power unit (APU). This proposal would allow the Air Force to lease engines, providing a low cost means of modernizing the Air Combat Command (ACC) B-52H weapon system. Installation of the proposed engines and APU would result in significant maintenance reductions for the engines while providing on-board ground power for general aircraft maintenance. The reduced fuel consumption of the modern engine would extend the un-refueled operational range of the aircraft. This proposal would also result in reduced "foot print" requirements when ACC deploys the weapon system by reducing the requirements for Aerospace Ground Equipment (AGE) electrical power carts and start cart equipment.

(b) The proposed support structure provides for all "below the wing support" of the engine through Contractor Logistics Support (CLS), around the clock & around the world. The proposal also provided for contractor owned and maintained pre-positioned spares at ACC B-52H operating locations as well as on site Contractor Field Service Representatives (CFSRs). The depot engine maintenance would be performed by the FAA compliant American Airlines service facility that currently maintains that airline's fleet.

(c) Key to the success of this type of modernization though long-term leases are changes to the USC allowing this approach to capitalize on existing commercial technology and practices. This would allow the U.S. Air Force and other services to benefit from off-the-shelf products through lease agreements and shared pooling of assets with commercial users.

(d) This proposal is on hold as the Government is currently involved in a re-engine study for all Air Force operated TF-33 powered engines.

(2) Lessons Learned.

(a) The contractor must recognize there is no economical trade off to war fighting capability. This is paramount.

(b) Current laws prevent both the Government and the contractor from taking full advantage of leverage items. For example:

1. Government leasing from the contractor must include commercial terms and conditions regarding indemnification, risk of loss and termination liability.

2. "Color of money" issues may inhibit the Government from being able to affordably upgrade their weapon systems under a lease or Flexible Sustainment concept.

3. Office of Management and Budget (OMB) requirements for "scoring" of termination liability presents a significant obstacle to the Government's ability to make an affordable "business case" for commercial contracting/leasing.

4. Indemnification of contractor liability remains a "show stopper" in the ability to fully implement and take advantage of best commercial practices.

5. Development of accurate Life Cycle Cost (LCC) or "payback" analysis depends on equal sharing of government and contractor data. Accurate government depot cost data is not always available. Contractor cost data is sometimes overly optimistic.

D. ***KC-10***

(1) Oklahoma City Air Logistics Center provides centralized program management for commercial derivative aircraft including the KC-10. Commercial derivative aircraft are defined as aircraft originally designed for sale on the open market to non-military buyers. These aircraft may be used "as commercially built" or as modified ("missionized") to perform a military role. The program manager provides Contractor Logistics Support (CLS) for whole systems and does not manage Contract Depot Purchased Equipment Repair, even though they deal with commercial derivative aircraft. Program management personnel perform the day-to-day management of CLS contracts, which includes metric collection and analysis. The program manager maintains all their aircraft to Federal Aviation Administration standards. The KC-10 aircraft are subject to USAF Sustainment Executive Management Report (SEMR) reporting requirements.

(2) A single contractor is used as integrator. A fixed price contract with limited award/incentives is used. This allows capture of total cost for an entire weapon system and better positions OC-ALC to assist the Major Air Commands (MAJCOMs) in preparing future budget estimates. The MAJCOMs are responsible for submitting their budget estimates and for obtaining the necessary funding levels. They transfer the money to the program manager who disperses it to pay for contract administration. The program manager in turn furnishes each MAJCOM with information required to make sound fiscal decisions. The current contract was awarded to Boeing through a competitive re-bid process. The contract is for 5 years with 1 year options. The current contract contains contingency/wartime and Drop-In MAINTENACE (Heavy MAINTENACE) clauses. The contractor has demonstrated the ability to meet both clauses. The contractor is responsible for crash recovery utilizing a mix of contractor and base assets. The major portions of the contract are fixed costs (landing gear, engines, paint, Contractor Operated and Maintained Base Supply (COMBS) management, and "C" check). OC-ALC employs User Quality Assurance Evaluators and Weapons System Liaison Officers in some cases to help monitor condition of work and contract compliance respectively The current contractor is currently Boeing, who was awarded the contract from Lockheed for 5 years starting 1 October 1998.

(3) At the 305th at McGuire AFB, which has 32 assigned KC-10 aircraft, Boeing is responsible for overall CLS management, technical representation, engine and landing gear overhaul, and performance of an aircraft "C" check inspection. Boeing Corporation is responsible for parts management through the COMBS and associated support equipment. AF and contractor personnel maintain the KC-10 fleet to FAA standards and the contractor holds the FAA 8110-2, Supplemental Type Certificate.

(4) The 305th Logistics Group Commander is in charge of both flight line and back-shop maintenance. He conducts a daily maintenance standup with contractor representation.

(5) In the COMBS, operators inventory, store, and maintain 22,000 line items. The majority of assets are government owned/contractor furnished and broken into exhibited (contractor responsible) and non-exhibited (AF) responsible items. The USAF has contracted for COMBS management of 14 USAF stock listed parts as well. The contractor utilizes a company computer system for asset availability at Travis AFB, CA and Greenville, SC main Headquarters. The contractor has implemented their own Due-In From Maintenance tracking system for parts repair and follows the standard base supply Urgency of Need/Urgency Justification Code (UND/UJC process. The contractor bills the ACO for parts repair Beyond Fair Wear and Tear. The contractor can pull from civilian (airport) sources to meet AF mission priorities upon proof of a valid FAA serviceable tag, but the opposite is not true. The contractor has the option to direct the mode of transport for lateral support based upon the UND/UJC. The government pays for all transportation costs per transaction.

(6) The contractor handles modifications of KC-10 aircraft by way of OEM or Aircraft Management Service Bulletins. These usually affect performance, safety, or come as result of crash investigation. If the MAINTENACE capabilities exist at the USAF level, OC-ALC will issue a TCTO. If not, either a contractor or FAA team will accomplish the required MAINTENACE. Boeing routes all information to OC-ALC Engineering for advisement. The LG can authorize a 1X inspection of the fleet and the contractor will review the results for possible civilian aircraft applications.

(7) Lessons Learned.

(a) The program manager is providing the USAF with effective administration of the CLS systems they are managing. They are primarily concerned with commercial derivative type aircraft, however their expertise has been sought out for informal consultations on other programs considering CLS such as the C-17, F-117, and F-22.

(b) Contract growth was a major concern from higher levels of supervision. The contractor is very responsive to items contained in the contract, but not too responsive to over and above issues. These items normally end up having a high dollar valued attached. Another avenue of concern was the lack of field level input/review for contract negotiations. Many times, the sub-contractor would have to retool in order to manufacture parts. The determination of Fair Wear and Tear is an apparent issue that has a high dollar value attached. The contractor normally decides what is beyond the accepted norm and bills accordingly. The Wing is presently taking steps to help remedy this situation by adding a military check and balance. The contractor also sends ground support equipment to a contracted facility for calibration despite being collocated next to the base PMEL Lab. Maintenance Supervision has had support equipment problems in the past due to lack of availability.

E. *T-1A Air Vehicle Contractor Logistics Support (CLS) Program*

(1) Background.

(a) The T-1A is a militarized version of the BeachJet 400A. It is used to train USAF Transport and Tanker Pilots. Additional missions of USAF Bomber Pilot and Joint USAF/USN training may be added.

(b) The T-1A is a fairly clean example of a largely commercial product. The vehicle was acquired under a user requirements, Integrated System For Specialized Undergraduate Pilot Training, 1992 SORD as updated by AETC letter, dated April 1998. The program is ACAT II DAC Program, PMD 2415(1), dated April 1998.

(2) Support Concept.

(a) The support concept for the T-1A is contractor logistics support. Under this concept a contractor is expected to operate a Contractor Operated and Maintained Base Supply (COMBS) including parts warehousing and a management system where the contractor is responsible for all Contractor and Government furnished parts spare parts.

(b) The contractor is also required to accomplish major maintenance, at all bases, including repairs, modifications and O-Level Maintenance. Key performance parameters are tracked and guaranteed. Contractor compensation and performance is based on a flying hour program.

(3) Sustaining Engineering. Sustaining engineering is also performed by a contractor. Under this program the contractor is required to investigate and resolve deficiency reports, aircraft mishaps or emergencies; accomplish modification engineering/implementation and technical data updates.

(4) Summary. The T-1A Program is an effective use of contractor logistics support.

F. *Worldwide LANTIRN Depot (WWLD)*

(1) The LANTIRN system consists of a targeting pod, a navigation pod, and related support equipment. Over 1,400 LANTIRN pods are under contract or already fielded on F-14, F-15, and F-16 aircraft used by the USAF, the USN, and eleven foreign countries. Additional orders for another 100-500 pods and modernization initiatives will keep production going into the 21st century.

(2) Pre-WWLD LANTIRN Depot Repair Support. During 1992-1998, Lockheed Martin Electronics & Missiles (LMEM) performed depot repairs at its Goldsboro, NC, Special Repair Activity (SRA) for USAF "overflow", all USN, all direct commercial international, and some FMS customers. The USAF used its depot at Warner Robins Air Logistics Center (WRALC) to perform most USAF and some FMS depot repairs. Organic depot workload was projected to increase by about 50% during 1998-2001 due to increasing pod density in the inventory. An increase of this magnitude would cause a capacity shortage on some existing organic test stations at the WRALC. The primary effect of a capacity shortage at the ALC would be a significant negative impact to overall USAF support and a need for U.S. taxpayer investment in additional organic depot test equipment. USAF mission capable rates, which are required to be at least 85% for both LANTIRN pods, were consistently below 80%, and a new $6M depot equipment purchase was being sought.

(3) WWLD -- Phase 1. On 12/3/97, WRALC and LMEM enthusiastically formed the WWLD partnership to improve support to and reduce depot costs for all LANTIRN customers. The Government recognized that LMEM can perform certain repairs more cost effectively and in less time than the organic depot and was contracted to do these repairs under a guaranteed workshare, five-year, $20M, FFP, requirements-type contract with WRALC. To perform this contract, LMEM relocated its depot equipment and personnel into the same WRALC building that houses the USAF organic LANTIRN depot. LMEM leases approximately 14,000 square feet of space directly from the US Government.

LMEM invested $1.5M to move from Goldsboro to WRALC and is recovering this investment over the five-year period in the repair prices charged. Since the $1.5M was determined to be unallowable as a cost of doing the actual repairs, a TINA waiver was sought and received so as to allow the contract to be awarded at prices that included the investment recovery.

In the year since the WWLD partnership was formed, this joint contractor-government depot effort has succeeded in improving the LANTIRN mission capable rates to 87%. Repairs of some of the most critical LANTIRN targeting pod items are being completed much faster than a year ago, and all of the relatively aggressive contract repair time requirements are being exceeded by a minimum of 60%.

The co-location of LMEM and WRALC equipment and personnel has already provided significant surge and synergism benefits: (a) depot repair costs are being decreased by about $5M over the five years, (b) the USAF has avoided almost $6M in additional capital investment at the WRALC for additional test equipment capacity, and (c) recent June ’98 and August ’98 surge exercise production met all requirements. The success of the WWLD was a significant factor in the LANTIRN program being awarded the 1998 General Schreiver award for “Outstanding Product Management” by AFMC.

(4) WWLD -- Phase 2. The second phase of the WWLD partnership involves a separate contract wherein the organic WRALC depot will repair certain items for which LMEM has no in-house capability. LMEM will pay WRALC (directly) about $4-5M over five years to accomplish these repairs. The objectives of Phase 2 are to reduce repair costs further and to achieve even quicker turn times. Currently, LMEM is awaiting a one-year FFP proposal from WRALC for this work.

A significant prerequisite to the planned mid-1999 start of Phase 2 is designation of WRALC as a Center of Industrial and Technical Excellence (CITE) by DoD as required under our interpretation of 10 USC 2474. Other minor issues involving 22 USC 2770 and 10 USC 2553 requirements are also being worked at this time.

3. ARMY PROGRAMS

A. *Apache*

(1) Background.

(a) In the 10/29/97 Commerce Business Daily, the U. S. Army announced a plan to award Team Apache Systems (TAS), LLC a contract of up to five years to support AH-64 Apache helicopter weapon systems.

(b) TAS submitted an unsolicited proposal in April 1997. The Army leadership embraced the innovative concepts and savings potential encompassed within the proposal and approved a sole source J&A on 3 October 1997. Alpha contract negotiations began in January 1998 and were completed 18 June 1998 with a scope and price agreement that provided the following significant benefits to the U. S. Army:

- Firm fixed price per flying hour contract with shared savings provisions
- 16% reduction in flying hour program cost, to include:
  - 20% increase in flying hours
  - $320M of Apache modernization
  - life of contract performance warranty/obsolescence avoidance
  - significantly (+60 personnel) increased technical field support
- Price commitment for follow-on contract
- 25,000 hour surge capability
- Performance based guarantees
- Partnership with CCAD
- System configuration management with refresh/management of War Reserve Inventory

(c) An A-76 waiver request was forwarded to ASA-ILE 12 November 1998 with the required most efficient organization (MOE) cost comparisons currently on going. The Army designated Apache PVS a Section 912C pilot program with OSD following in February 1999 and designating Apache PVS as a Section 816 DoD pilot program. A-76 waiver approval is expected in April 1999 with subsequent contract award in July 1999.

(2) Support Concept.

(a) Team Apache Systems (TAS) Limited Liability Company (LLC) is a 50/50 partnership between Boeing's McDonnell Douglas Helicopter Systems and Lockheed Martin's Electronic and Missiles. TAS is led by Boeing as the aircraft integrator with Lockheed Martin performing the primary avionics systems integration and support role and includes General Electric as the largest Apache subcontractor. TAS will be based in Huntsville, Alabama where the Joint Project Office (JPO) for Apache sustainment will be located even though the majority of work under the PVS contract will be performed at the member company and major subcontractor locations.

(b) TAS will be responsible for all activities required maintaining the wholesale sustainment of the Apache weapon system in accordance with the performance metrics within the PVS contract. The government effort within the JPO will retain the responsibility for resource management, budgetary activities/funding management, war reserve requirements, and airworthiness/safety of flight change approval. TAS will perform all other wholesale sustainment functions to include:

- Spares requirements determination, planning and management
- Parts acquisition, distribution, transportation and inventory management
- Depot repair /support and engineering services

- Obsolescence management
- Configuration control authority
- Worldwide field technical/supply support.

(3) Lessons Learned.

(a) Focused, sound, and timely analysis is critical to support decisions for revolutionary new concepts such as Apache PVS. It may be harder to do, but it is very important that it be done, and done in a way characteristic of the way the Army produces an analysis of alternatives to support milestone decision making for major weapon systems (ref DoD 5000. Key characteristics of such an analysis should include analytical oversight by GOSG. This COSC would provide oversight to review/approve:

- Study plan
- Progress
- Published results
- Early definition of, and GOSG approval of, the decision issues
- Designation of a full-time Study. Director responsible for the total analytic effort (planning, execution, integration, analysis, and reporting)

(b) Murder Board more products more often. If it is revolutionary, it probably has more risk. For example, an alpha-negotiated contract should probably be reviewed by a group of experienced KOs in addition to the functional requirers.

(c) The task of outsourcing Apache wholesale logistics support was taken on by the PEO Aviation (SARD&A). Apache wholesale logistics support is the mission of AMC (DCSLOG). This created a competitive adversarial relationship. Outsourcing initiatives of this magnitude should be conducted on a partnership basis with mutually agreed objectives between the impacted Government entities.

(d) The PVS process was driven by a schedule established by the PM and acquisition senior staff. It was date-driven, not event driven. Senior Army managers established a schedule and held the Alpha team responsible to meet the schedule. This was a major factor in the positive progress that was made; however, the delayed decisions from senior Army management negatively impacted the schedule, but the schedule was not adjusted. The Team Apache Systems (TAS) team delay in submitting their final proposal and the delay in the approval of the A-76 waiver request impacted the execution date of the contract. Realistic time frames must be established based on the work at hand and not on a desire to execute a contract at the beginning of a fiscal year.

(e) In order to establish a baseline for the PVS concept, the Government should have taken a bottoms-up approach very early on (at least 12-15 months before contract award). A team of Government employees and contractors must define exactly what the contract should contain. The reason for this approach became very evident during development of the transition plan, which identified several required functional processes, which were not in the Alpha contract. Therefore, necessary adjustments and re-write of sections of the Alpha contract were required. The TAS did not understand the complexity of the logistics system and the interfaces required

to tie in with existing Army standard systems.

Joint review of the Transition Plan between TAS and the Government did not occur until after TAS had developed initial pricing. This resulted in numerous functions and tasks not being priced by TAS. There were various missions and functions that TAS did not agree to perform. The TAS was selective in which logistics processes they would perform.

(f) The contract, Performance Work Statement (PWS), and Transition Plan were developed at the same time and this presented obstacles, which delayed the development of each and presented a communications problem between the different teams. The actual PWS and contract should have been developed before transitioning ever started. It is impossible to develop a Transition Plan when neither the PWS nor the contract has been agreed to in principle. All three documents must compliment each other without contradictions.

(g) The PVS should have qualified as a DoD Acquisition Category 1 (ACAT 1) system acquisition (possible commercial off-the-shelf streamlined acquisition). As such, most of the problems experienced would not have occurred. The PVS would have had a PM designated at Milestone 0, the Program would have had the DoD 5000.2 regulatory support necessary for each exit criteria, and a measurable schedule would have been provided.

(h) The entire PM/AMCOM team misjudged the time and energy it would take to obtain the waiver to the A-76 study requirements. Since this is the first major PVS effort within the Army, the senior Army staff has proceeded at a cautious rate with regard to granting a waiver. Based on what we know at this time, it probably would have been just as quick to have conducted this study under the A-76 rules of engagement and forego obtaining a waiver. The time frame would have been nearly the same and the required briefings and interface at the Department of the Army-level would have been reduced.

B. ***Multiple Launch Rocket System (MLRS)***

(1) Program Description.

(a) Driven by the need to discover aggressive cost reduction efforts, the Army Acquisition Executive (AAE), and the Commander, U.S. Army Material Command (AMC) issued a memorandum in October 1996 directing major programs to develop Cost Reduction Plans. Since that time, PEO Tactical Missiles and the PM MLRS have actively participated in the research, evaluation and the development of various cost reductions initiatives. The team focused on the following candidate areas to determine potential opportunities to reduce the total cost of ownership:

- Partnering
- RDTE
- Procurement
- Consolidation of manufacturing sites
- Demilitarization

(2) Program Life Cycle Phase: Concept Exploration.

(3) Degree/Aspects of Contractor/Commercial Support.

(a) The plan ranges from a system of Prime Vendor Support that is integrated, managed, and operated by contractors, on a worldwide scale, to a mix of organic and CLS services that optimize equipment readiness and life cycle cost reductions.

(4) Program Potential for Success With Regard To Logistics/Engineering Support.

(a) Develop a plan for an optimum mix of Contractor/ Organic logistics resources organized and managed to sustain MLRS fleet readiness at a significantly reduced level of life cycle cost (LCC).

(b) Incentivize performance of contractor provided logistics, equipment reliability, and technology insertion through a system of metrics, measurement, and periodic cost savings targets.

(c) Develop a verifiable cost baseline of organic LCC estimates from which to compare cost savings of logistics support on a by-year and cumulative basis.

(d) Utilize partnerships and Alpha contracting techniques in planning, controlling, problem solving, and evaluation of logistics services.

(5) Program Potential Shortcomings In Regard To Logistics Support.

(a) Performances of many logistics functions are governed by federal statutes concerning depot utilization, capability, outsourcing, and force structure reduction.

(b) The potential issue of the Base Realignment and Closure Act (BRAC) could become a consideration in the future if installations and depots continue to be recommended for closure or realignment and workload transferred.

(c) There are recognized barriers to the successful implementation of partnering agreement that include: failure to abide to the agreement, potential impact to competition, lack of commitment, lack of training funds and “old school” mentality.

(6) On Going Cost Reduction Initiatives.

(a) Implementation of multi year procurement strategy for production.

(b) Contractor control of technical data packages (the government will control the system specification and interfaces.

(c) Use of commercial parts in lieu of military specification/standard parts.

(d) Use of Contractor Field Technicians (CFTs) to replace government logistics assistance representatives.

(e) Assigning the contractor responsibility for fielding software and updates.

(f) Transferring responsibility for publications to the contractor and converting documentation to electronic media.

(g) Certifying the contractors for provisioning data.

(7) Recommendations.

(a) Key to ensuring the opportunity for continuous modernization is not simply providing cost savings but to have in place a documented plan for the reinvestment of those savings.

(b) Establish an Executive Level Partnering IPT to outline the principles for future program execution.

(c) Evaluate the organizational structure of the Program Office, functionals, and contractor to propose a structure that would best support future operations.

(d) Implement defined cost of ownership reduction initiatives addressing the top cost drivers

(8) Conclusions.

(a) As results began emerging from the sub-teams, we realized that the overriding focal area was not Systems Improvement or Sustainment, as originally thought, but Business Approach. The approach to the new way of doing business with partnering as the theme - the core process - is viewed as the key to making it all work. Failure to pursue the challenges of the future as partners in a Government/Contractor team will result in the non-realization of the potential benefits of a modern, cost effective, long term program.

(b) The approach to conducting business is directly impacted by the organizational structure. Although the intention was to defer organizational changes to a later date, it became obvious that a responsive organization was required to properly execute and sustain cost of ownership reduction practices.

4. DEFENSE LOGISTICS AGENCY (DLA)

A. *Hamilton Standard Prop.*

(1) Program Name. Virtual Prime Vendor, C-130 Propeller System Defense Supply Center Richmond.

(2) Program Description. Providing parts in sync with customer requirements through implementation of the integrated supply chain enterprise.

(a) VPV effectively manages assets, resources, cycle times orders and throughput at near optimal efficiency levels.

(b) DoD logistics managers and industry partners lower operating costs, reduce inventory investment, increase inventory turn and lower product handling and transportation costs.

(c) Reengineered processes operate in a paperless environment that eliminates redundant asset levels, removes procurement constraints and optimally manages inventories.

(3) Program Budget. Limited operational budget and government staff augmented by consultants and combined with interactive technology collaboration.

(a) Program support and detailed business case analysis performed by consultants - small core program management staff receives matrix support from functional areas.

(4) Aspects of Contractor Commercial Support. To achieve synchronization the VPV contractor: provides LRU and sub-component management, interfaces the fixer and material manager, establishes and monitors PSI levels and all inventories, provides expedited service and back-order chasing, warranties parts, forecasts requirements, re-utilizes excess material, provides surge and sustainment to the warfighter and interfaces the information systems.

(a) Performance measurements (QPM) metrics include issue effectiveness, backorders (age and quantity) and customer material returns.

(5) Program Successes in Regard to Logistics Support. Programs successes include working toward elimination of redundant levels of inventory (SSC, retail, service wholesale and DLA wholesale) to a single small inventory at the fixer level (SSC).

(a) DLA items being managed by VPV to attrition $11.2M, SSC inventory levels being reduced to $1.3M vice $3.6M.

(b) Will achieve first operational surge and sustainment directed to a weapon system platform within DLA as well as a zero return rate for VPV issued parts.

(6) Program Shortcomings in Regard to Logistics Support. Continuing challenges include systemic integration, delivery performance, improved business case analysis and flexibility to expedite change.

(a) Linking and interfacing legacy information systems a significant challenge, falling short of required delivery performance metrics for high priority worldwide and time on backorder requirements, no complete business case analysis to establish baseline and judge results, need to synchronize process to respond more quickly to changing conditions and requirements.

(7) Impediments to Logistics Reform. Avoiding the pitfalls.

(a) Continual effort to shift the financial, legal or vendor domination of the purchasing process to a seamless supply chain management concept.

(b) Emphasis on vendor pre-qualification vs. references, reputation and existing relationships.

(c) Defusing short term benefits as the dominating decision factor.

(d) Flexibility must be key in the contracting arrangement as well as risk management of information system interfaces.

(e) Overcoming the business interruptions caused primarily by budget constraints, demand forecasting and back up operation of information systems.

(8) Recommendations.

(a) Establish a consistent BCA methodology that spans the supply chain enterprise.

(b) Partner with military services and DLA to effectively work projects together for integrated supply chain management throughout the weapon system platform.

(c) Identify and exploit acquisition tools and methodologies with proven successful results.

(9) Conclusion. Extending and effectively managing the supply chain encompasses every aspect involved in producing and delivering final product from the supplier's supplier to the customer's customer.

(a) Successful strategic alliances are a direct result of closer buyer/supplier relationships and can offer technical, financial and strategic advantages over vertical organizations.

B. ***Bell Helicopter***

(1) Program Name. Corporate Contract Bell Helicopter (UH-1, AH-1, OH-58) Defense Supply Center Richmond.

(2) Program Description. Providing inventory, both government-owned and Bell-owned inventory to military and commercial customers.

(3) Background. Since this procurement action was the first attempt by DLA to institute a corporate contract, some background information is deemed appropriate. Initially, DLA desired to have Bell provide supplies via direct vendor delivery (DVD) to DoD customers within short delivery times. Bell however was reluctant to enter into a DVD arrangement because of high start up costs associated with developing a level of inventory to meet uncertain DoD demand. Bell proposed that DLA transfer inventory to a Bell facility to offset these high inventory startup costs in order for Bell to meet DoD demand and delivery times. By doing such, Bell would be able to analyze the pattern of the incoming demand and program it into its own inventory replenishment models while satisfying demand from existing inventory. Bell also received permission to intermingle DLA inventory with any Bell owned inventory to establish one inventory management system. The DLA inventory (all less 45 days worth) was transferred to a Bell facility. The remaining inventory of 45 days was then drawn to a zero balance either through Material Release Orders (MROs) or Delivery Orders (DOs) awarded to Bell via the paperless ordering procurement system (POPS). For accounting purposes in the material management system, Bell operates as both a requisitioner and a depot. If Bell wishes to purchase one of the items in the DLA stock for a commercial customer, Bell submits a requisition to DLA just as a customer would submit. Stock is debited and a bill for the negotiated prices for that item is generated to Bell in the same manner that any customer would be billed. Bell's payment is sent to DFAS and then credited to the stock fund of the applicable supply center. When a requisition is received from a DoD customer through the standard DLA process, the requisition is forwarded to Bell as an MRO just as if Bell were any other DLA depot. Bell issues the items from stock and a record on inventory is debited. Bell is paid a transportation and a negotiated handling fee. When DLA owned stock is exhausted at Bell, a requisition is routed to Bell as a DO for the purchase of new stock. Bell then invoices through a pilot program system (Payment to Contractor via Credit Card) for payment whereby Bell forwards the DO invoices to DCMC for validation. Once validated, Bell forwards invoices to a bank (Rocky Mountain Bank) who then forwards the invoice on to DFAS. The contract also

allows for Bell to request review of potential excess inventory through the appropriate DLA item manager.

(4) Program Budget. limited operational budget with one contracting officer administering the contract.

(5) Aspects of Contractor Commercial Support. The contractor to provide inventories management and forecasting, expedited service, back-order chasing, warranties, and excess material disposal.

(a) Performance measurements metrics include: fill rate percentage of orders shipped within 8 days; delivery time reduction to 8 days for routine and 48 hours for NMCS and AOG requirements; and reduction of backorder filling time.

(6) Program Successes in Regard to Logistics Support. gradual transition of filling DoD demands with DLA owned stock via Material Release Orders (MROs) to Bell owned stock via Delivery Orders (Dos) allowed a seamless transitions to the customer; reduction of DLA inventory through attrition; reduction in number of contracts, reduction of personnel required to administer contract; improvements to metrics.

(7) Program Shortcomings in Regard to Logistics Support. initial reluctance to initiate contract; EDI implementation; flexibility to expedite changes to contract; improved Business Case Analysis (BCA) process.

(8) Impediments to Logistics Reform. acceptance of a standard BCA process, implementation and adaptation of EDI linking, defusing short term benefits as a dominate decision factor, maintaining a flexibility posture for contracting efforts, and shifting from the position of status quo to proactive contracting.

(9) Recommendations. continue to work on and establish a standard BCA for other corporate contracts; increase partnering arrangements with military services and DLA to improve the supply chain as a single linked logistics enterprise throughout the weapon system platforms.

C. *Corporate Contracts*

Defined as the establishment of a single DLA-wide contract by a lead supply center with a major OEM for use by all centers. Utilizes long-term contracting, options, Direct Vender Delivery (DVD) and Electronic Commerce (EC) for multiple product lines consolidating DLA business into a single contractual vehicle. DLA has entered into long-term contracting with various suppliers (e.g. Bell Helicopter, Boeing Helicopters, etc) by combining requirements from more than one supply center in providing sole source or proprietary consumables. Although corporate contracts have unique features, the overall principle behind the contracts is for DLA to combine requirements in order to gain negotiation leverage with the contractors on delivery, quality and price issues. The major benefits of corporate contracts are to improve customer support; lower overall costs and provide a higher return on bid submission for industry. Under some circumstances where there are significant improvements to customer support, some increases in price compared to traditional management may be considered if the overall arrangement can clearly be shown to be beneficial to the Government.

(1) Some of the corporate contracts issued by DSCR include the following:

(a) Bell Helicopter (UH-1, AH-1, OH-58).
NSNs: 1479
Current Value: $49M
Contract Term: 3 Yr Base with 2 option years
Note: Discussed in detail below

(b) Boeing Aircraft (KC-135/E3A).
NSNs: 80
Current Value: $1.7K
Contract Term: 1 Yr Base with 4 option years

(c) Boeing Helicopter (H-46, H-47)
NSNs: 214
Current Value: $7.4M
Contract Term: 1 Yr Base with 4 option years

(d) Grimes Aerospace (Multiple aircraft)
NSNs: 736
Current Value: $10.5M
Contract Term: 1 Yr Base with 4 option years
Note: entire item transfer to DISC for management

(e) McDonnell Douglas fighters (F-15/F-18/AV8B)
NSNs: 323
Current Value: $2.5M
Contract Term: 1 Yr Base with 4 option years

(f) Other DSCR corporate contract initiatives in various stages of proposal
Sikorsky helicopters (H-60/H-53)
Allison engines (T-56/C-130)
Grumman aircraft (F-14/EA-6B)

5. SUMMARY AND FINDINGS

As evident from the case studies addressed in this section, commercial support of aviation systems has proven a viable, cost effective support solution for a variety of types of equipment with a wide spectrum of operational requirements. Also evident is that each of these programs was required to overcome impediments and make compromises, which may have resulted in a less than optimal solution. It is also significant that virtually all of these programs arrived at a solution in which the government and industry share responsibility for the support of the end item. It appears, thus far, that a total contractor logistics support solution will be the exception rather than the rule, especially for deployed systems. One of the more obvious generalizations that can be derived from these case studies is that teaming and partnership between government and industry are the most effective way of overcoming impediments while delivering the most cost effective support to the warfighter. Those programs which pursued performance-based contracts have identified cost savings associated with their initiatives. It is also significant that a number of initiatives have been stalled, or even reversed, because of difficulties encountered in implementation.

The members of the working group and the members of the Joint Aviation Logistics Board wish to express appreciation to the various Program Managers for the time and effort devoted to this project. It is also noted that none of the inputs have been modified or edited in any manner for this publication.

SECTION III

PERFORMANCE BASED LOGISTICS (PBL)

INTRODUCTION

In the Performance-Based Business Environment (PBBE) guidance, the concept of Flexible Sustainment is introduced. In the discussions of the Working Group it became clear that another term needed to be added to the vocabulary of logistics to broaden the scope of initiatives and tools to those applied not only to new acquisitions, but also the legacy systems in DoD's inventory and all the elements of logistics. It was felt that "Performance-Based Logistics" (PBL) provided a more comprehensive and descriptive link to the PBBE. PBL not only includes the reliability improvement concepts of Form-Fit-Function-Interface (F^3I), Reliability-Based Logistics (RBL) and Trigger-Based Asset Management (TBAM) introduced under Flexible Sustainment (FS) for systems and components, but also includes improving all aspects of DoD's logistics and sustainment systems as well as its industrial partners that provide support.

Performance-based Logistics is a concept that proposes that all logistics support elements can be incorporated within the PBBE. PBL includes flexible sustainment, but also incorporates direct vendor delivery (DVD), technology insertion, Reliability-Centered Maintenance (RCM), process improvement, business re-engineering, and public/private partnering and teaming. It includes improving all the support elements of logistics. PBL can be applied to fielded/legacy systems as well as new acquisitions. The basis of PBL is establishing logistics performance requirements and contractual incentives to mitigate obsolescence and lower the cost of ownership. Performance requirements for logistics support can be established for Government entities as well as industry.

In addition to product improvement through FS, performance metrics and reengineering can be applied to the support planning and execution elements as well to improve overall logistics response. All of the following elements must be included in PBL:

- Systems engineering
- Reliability and maintainability interface
- Maintenance planning
- Support equipment
- Supply support
- Packaging, handling, and transportation
- Technical data
- Facilities
- Personnel requirements planning
- Training and training support
- Logistics support management information
- Computer resources support
- Energy management
- Survivability
- Logistics support test and evaluation

It has been well documented in a number of studies that improperly conceived measurement and reward systems can bring about unexpected and undesired results. Traditional measures for logistics support activities have been such measures as units repaired per quarter, inventory levels, safety stock, response time, etc. Traditional logistics measurements encouraged behaviors that have led to increased costs such as carrying "just-in-case" inventory to insure no stock-outs. Another cost increasing behavior is to continue to fix items without considering the cause of failure. There was only regard for item availability, or in other words, a pool from which to draw. Repair facilities were measured on output irrespective of an item's need and sized according to backlog and throughput. The emphasis was on meeting demand, not reducing it. The Working Capital Fund (WCF) (formally the Defense Business Operations Fund) financial accounting system has contributed to counter productive behavior in providing logistics support.

Under performance-based logistics we are looking for metrics and methods of management and/or contracting that will motivate logistics providers (Government and/or industry) to increase availability and reliability of weapon systems through technology insertion and improved processes and to reduce total operation and support (O&S) cost. Through PBL, the cost of ownership can be decreased as the need for pipeline spares is reduced due to improved reliability and faster repair and distribution. A lower investment in inventory can be achieved as a result of improved reliability, pooling of assets, and faster distribution. Reliability-Centered Maintenance will realize the inherent reliability of complex equipment. And, the foregoing will also allow for reduced infrastructure at all levels of maintenance and support. Properly conceived measurements and rewards/incentives on performance requirements driven by the weapon system user can encourage partnering/teaming between industry and government to take advantage of the strengths of each as well as causing overall logistics system and product improvement. The goal of PBL is to provide the warfighter with the necessary capability to protect the Nation's interests at the lowest long term cost to the taxpayer.

Some examples of initiatives that would fall under PBL are the Navy's "Direct Vendor Delivery for Reparables (DVD-R)", the Air Force's "Lean Logistics", and the Army's "Velocity Management." These projects are in their early phases of implementation.

1. DIRECT VENDOR DELIVERY – REPARABLES

A. Direct Vendor Delivery (DVD) is a procurement technique first utilized by the Defense Logistics Agency (DLA) to provide large volume commodity items more efficiently and economically direct to the end user. The first case was delivery of pharmaceuticals directly from the vendor (commercial distributor) to the requisitioning military hospital. It was also used to provide foodstuffs directly to military commissaries from distributors and spare parts from Bell Helicopter directly to U.S. Army users.

B. The U.S Navy has recently redefined "DVD" to include reparables and is expanding the concept to provide total logistics support to the NAVAIR/NAVSEA community. Direct Vendor Delivery – Reparables (DVD-R)(also referred to as DVD-Plus (DVD+)) is a form of Performance-based Logistics (PBL). The concept development has been a joint effort of NAVICP and Aerospace Industries Association (AIA) member companies. DVD-R is one of four acquisition strategies proposed by NAVICP in its 1997 – 2001 Strategic Plan. The purpose of DVD-R is to reduce the Government's overall cost to provide weapon system logistics support, improve availability and reliability, and to streamline the procurement/administrative process.

C. The term DVD-R, or direct vendor delivery for reparables, is used when a DVD contract

covers repair/overhaul of hardware. Under DVD-R, contractors will provide complete supply/support chain management that includes the following functions previously handled by the government buying agencies and repair depots:

- Item Management
- Transportation Management
- Field Service
- Repair/Overhaul
- Sustaining Engineering
- Technology Insertion
- Configuration Management (Form, Fit, and Function)
- Technical Manuals and Updates
- Warehousing
- Inventory Management
- Reliability Analysis
- Product Improvements to Lower the Cost of Ownership

D. The following table shows a summary of the variety of tasks provided by a contractor under different types of logistics models. The first column labeled "Tasks" lists the functions for logistics support handled by the military and contractors. Column two, labeled "MILITARY", shows the tasks that are currently performed, and contracted for individually, under standard repair contracts for the U.S. Government. Under this method, the contractor (or depot) is instructed ONLY to fix what is "broken" at that point in time. Under column three, "COMMERCIAL", are the tasks performed for repair of hardware used by the commercial airlines. Column four, "CPFH", are the tasks performed for commercial airlines under a "cost-per-flight-hour" or "power-by-the-hour" contract. Column five, "DVD-R", shows the tasks that would be performed under a DVD-Reparables/ Performance-based Logistics support type-contract for the U.S. military services.

Table 1

Comparison of Commercial, Cost-Per-Flying-Hour, DVD-R,
and Standard Military Logistics Support

(All factors shown are percentages unless otherwise noted)

TASK	MILITARY %	COMMERCIAL %	CPFH %	DVD-R %
1. Program Management	0	0	10	100
2. Item Management	0	0	0	100
3. Inventory Management	0	10	30	100
4. Inventory Investment	0	100	100	100
5. Warehousing	0	100	100	100
6. Transportation Management	0	0	0	100
7. Availability	Lead-time	30 days	20 days	48 hr
8. Field service	Reactive	100	100	100
9. AOG Service	Reactive	100	100	100
10. Configuration Management	0	100	100	100*
11. Technical Manuals	0	100	100	100
12. Reliability Analysis	0	100	100	100
13. Maintainability Analysis	0	100	100	100
14. Rotable stock	0	100	100	100
15. Improved MTBD	0	0	Proactive	Proactive
16. Technology Insertion	0	Reactive	Proactive	Proactive
17. Hardware Repair, Mod and/or Overhaul	100	100	100	100
18. Streamlined Paperwork	0	0	100	100
19. Reduce Receivables	0	100	100	100
20. Promotes Teamwork	0	0	100	100

R *At present, the Government is contemplating authorizing only Class II Form, Fit and Function (F^3I) contractor responsibility. Significant savings can be achieved if Class I (F^3I) responsibility is given to the contractor team at the weapon system level.*

E. DVD-R contracts offer significant customer benefits and value-added improvement over the standard military repair contract. Current repair contracts and depot direction require the return of retrograde to "serviceable but not like new condition" only. In contrast, DVD-R is a service-type, performance-based contract. Key metrics of a DVD-R contract includes AVAILABILITY and RELIABILITY. The contractor is incentivized to repair all elements that are known to promote delivery of a more reliable unit – not a sub-optimized decision to just fix what's broken. Under some DVD-R contracts, the contractor may be penalized/incentivized based on their ability to meet specific availability and reliability improvement goals. Other key components of a DVD-R contract may include:

(1) Payments on a cost-per-flight-hour basis.

(2) Contracting on a commercial basis.

(3) Requiring achievement of specific TAT's for both CONUS (Continental U.S.) and OCONUS (Outside Continental U.S.) requisitions.

(4) Requiring achievement of guaranteed reliability improvements.

(5) Penalties/rewards based on performance to key metrics.

(6) Aligning contract term to achieve a strong company commitment.

F. A firm-fixed price contract for an extended period of time works best (generally three to five base years with mutually agreed to long term option periods). Long-term contracts are required so that the contractor is incentivized to make and can recover the investment necessary to achieve total program savings.

G. DVD-R has been developed in concert with various acquisition streamlining initiatives. The goal of these initiatives is to eliminate unnecessary regulation, delegate decision authority to the lowest possible organizational level, eliminate non-essential military specifications and standards and encourage maximum use of Commercial-Off-the-Shelf (COTS) equipment and processes. A successful Performance-based Logistics program incorporates all of the qualities that these initiatives are trying to promote: utilizing commercial practices, processes and products; fostering open communication; implementing a Performance-Based Business Environment; including risk management in the decision process; taking advantage of electronic commerce and data interchange capabilities; and promoting teaming/partnering between Government and industry. This process of linking performance to accountability will make the long-term logistics support of a weapon system more affordable.

H. ***Inhibitors.***

(1) NAVICP and the companies involved in the current initiatives have been attempting to implement specific DVD-R efforts for over two years. The cultural hurdles to implementing new ways of doing business and the impediments to outsourcing core workload are numerous and have made it extremely difficult to get on contract in a timely manner.

(2) While top level officials in DoD and the Services embrace the concept with a high degree of appreciation for its benefits, the people in the organizations who have to evaluate the benefits have no organizational or procedural structure to validate and justify non-traditional, "out-of-the-box" concepts such as performance-based logistics. At every turn in the Services' nondescript approval process, contractors are forced to deal with people that have no frame of reference on how to proceed with their staffing roles in evaluating, gaining internal support and approval, and implementing these proposals. The people who must approve these initiatives are risk adverse and are reticent to approve new concepts for which there are no precedence or guidelines.

(3) Not all stakeholders have been involved from the beginning in the early attempts to implement PBL contracts. An education process had to be included in every presentation. The lengthy time to go through each review and re-review introduced new players that caused the process to begin anew. This has cost contractors and the Government a great deal of time and money and has delayed the opportunity to implement money saving programs.

I. ***Recommendations.*** A process needs to be defined and accepted that will allow for evaluation and implementation of new ways of doing business. Emphasis needs to be

placed on total quality management concepts; especially recognition of the concept of employee empowerment to embrace new contracting methods that make sense. Government personnel need to be empowered to utilize a commercial best-value decision making process instead of a typical simplistic cost evaluation for which no accurate cost baseline exists.

2. LEAN LOGISTICS (Extract from GAO report NSIAD-98-97)

A. In 1994, the Air Force initiated a reengineering effort called Lean Logistics to dramatically improve logistics processes. The Air Force describes Lean Logistics as the cornerstone of all future logistics system improvements. This effort, spearheaded by the Air Force Materiel Command, is aimed at improving service to the end user while reducing pipeline time, excess inventory, and other logistics costs. The Air Force expects to save $948 million in supply costs between fiscal years 1997 and 1999 as a result of Lean Logistics initiatives.

B. Under Lean Logistics, the Air Force developed a program to redesign the current repair pipeline. It called for a Just-In-Time (JIT) approach to weapon system support that will convert Air Force logistics from a "push" to a "pull" support system. The focus is on rapid repair and flow of repaired parts through the pipeline in direct response to demands, thus putting the parts exactly where and when they are needed. To accomplish this, inventories are partially centralized while slightly "leaning" (or lessening) levels at bases, express transportation is employed to achieve response and speed, and dramatic process improvement is implemented. In June 1996, the Air Force began testing certain concepts at ten repair shops, and the tests involved less than one percent of the Air Force's inventory items. The concepts included repairing items quickly after they break, using premium transportation to rapidly move parts, organizing support (supply and repair) personnel into teams, and deploying new information systems to better prioritize repair actions and track parts. Each shop tested some of these concepts and identified system improvements needed to adopt these practices on a broader scale.

C. Notwithstanding the results of the demonstration projects, the Air Force began expanding these concepts service-wide in April 1997 and plans to complete this effort by the spring of 1998. According to the Air Force, the concepts will be refined as implementation continues.

D. In February 1997, the Air Force also began using a prime vendor program to support the C-130 propeller repair shop at the Warner Robins Air Logistics Center. In fiscal year 1998, the Air Force plans to expand the prime vendor program at Warner Robins and begin programs at two other Air Force repair depots.

E. ***Lessons Learned.***

(1) As part of its demonstration projects, the Air Force tracked overall performance in four general areas: customer impact, responsiveness to the customer, repair depot efficiency, and operating costs. According to an October 1997 cost-benefit analysis of these projects, the tests were not a complete success. For example, 70 percent of the shops showed improvement in depot repair efficiency, but only 10 percent of the shops showed improvements in improving the responsiveness to the customer. Also, three of the four performance areas showed mixed results for 50 percent or more of the shops.

(2) According to the Air Force analysis, full implementation of the concepts may need to be re-evaluated and refined to achieve desired improvements in customer service and

operating costs. The following table shows the impact of the demonstration projects on the four performance areas.

TABLE 2

Results of the Air Force's Lean Logistics Demonstration Projects
(Figures in percentages)

Performance Area	Shops with Improved Performance	Shops with Decreased Performance	Shops with Mixed Performance
Customer impact	20	30	50
Responsiveness to the customer	10	20	70
Repair depot efficiency	70	0	30
Operating costs	30	20	50

F. ***Recommendations.***

(1) The military service's current improvement efforts could be expanded to include a wider application of the best practices. In addition, the services have not established specific locations where a combination of several practices could be tested to achieve maximum benefits. These expanded efforts would be consistent with recent legislative provisions and the Defense Reform Initiative, which encourage the adoption of best business practices. However, a wider application of best practices by DOD must be accomplished within the current legislative framework and regulatory requirements.

(2) Previous GAO reports recommended the testing and implementation of best practices, specifically, prompt repair of items, cellular repair, supplier partnerships, third-party logistics, as well as an integrated test of these practices. The Navy and the Air Force have initiated programs to adopt certain forms of supplier partnerships, and the Air Force is pursuing the prompt repair of items throughout its operations.

3. VELOCITY MANAGEMENT (Extract from GAO report NSIAD-98-97)

A. An initiative to re-engineer the U.S. Army's logistics processes by improving flow (speed and accuracy) of materials and information through the logistics system, substituting velocity (reduced cycle times) for mass (large inventories), and continuously improving value-added activities and eliminating non-value added activities.

B. In January 1995, the Army established its Velocity Management program to develop a faster, more flexible, and more efficient logistics pipeline. The program's goals, concepts, and top management support parallel improvement efforts found in private sector companies. The overall goal of the program is to eliminate unnecessary steps in the logistics pipeline that delay the flow of parts through the system. The Army plans to achieve this goal in a similar manner as the private sector - by changing its processes and not by refining the existing system. The Army's Vice Chief of Staff has strongly endorsed the program as a vehicle for making dramatic improvements to the current logistics system. In anticipation of these improvements, the Army has reduced its operating budgets for fiscal years 1998 through 2003 by $156.5 million.

C. The Velocity Management program consists of Army-wide process improvement teams for the following four areas: ordering and shipping of parts, the repair cycle, inventory levels and locations (also known as stockage determination), and financial management. For each of these areas, the Army is examining its current processes and attempting to identify ways to improve them. The Army's implementation strategy for these improvement areas includes three phases: defining the process, measuring process performance, and improving the process.

D. The order and shipping improvement area is farthest along in the implementation process. In this area, the Army has reduced the time it takes to order and deliver parts to a customer located in the United States from approximately 22 to 11 days, or by 50 percent. According to Army officials, this improvement was achieved by automating the ordering process and having delivery trucks dedicated to servicing a single customer. The Army plans to continue work on other functions in this area, such as the receiving process.

E. The stockage determination and repair cycle initiatives have not advanced as quickly as planned due to difficulties in obtaining reliable data to measure the current processes. Also, the Army has not determined exactly what metrics to use for measuring future improvements. The financial management area is the last initiative to be started.

4. SUMMARY AND FINDINGS.

A. The military service's current improvement efforts could be expanded to include a wider application of the best practices. Commercial best practices, specifically, prompt repair of items, cellular repair, supplier partnerships, third-party logistics, should be evaluated for implementation. The services have not established specific locations where a combination of several practices could be tested to achieve maximum benefits. These expanded efforts would be consistent with recent legislative provisions and the Defense Reform Initiative, which encourage the adoption of best business practices. However, a wider application of best practices by DOD must be accomplished within the current legislative framework and regulatory requirements.

B. Studies and GAO reports have recommended the testing and implementation of best practices, specifically, prompt repair of items, cellular repair, supplier partnerships, third-

party logistics, as well as an integrated test of these practices. The Navy and the Air Force have initiated programs to adopt certain forms of supplier partnerships, and the Air Force is pursuing the prompt repair of items throughout its operations.

C. A process needs to be defined and accepted that will allow for evaluation and implementation of new ways of doing business. Emphasis needs to be placed on the concept of employee empowerment to embrace new contracting methods that make sense. Government personnel need to be empowered to utilize a commercial best-value decision making process instead of a typical simplistic cost evaluation for which no accurate cost baseline exists.

D. These initiatives are in the early stages of development and deployment. There is much to be done to educate both Government and industry personnel in the benefits of performance-based logistics and how to implement these new concepts of support that will achieve "better-faster-cheaper."

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SECTION IV

ACQUISITION REFORM TOOLS AND TECHNIQUES

Acquisition Reform: Tools and Techniques – What is the role for acquisition reform in the transition to commercial aviation support?

INTRODUCTION

The supportability of military equipment requires several acquisition reform tools for successful implementation of system readiness. These tools are primarily guidance documents/ pamphlets describing improved processes, which are designed to meet system readiness objectives. Many are available and accessible in printed and electronic versions. These tools provide each user with an understanding and an appreciation of the responsibilities and development efforts necessary during the acquisition process. The following are examples of existing tools that are published as single source guides for Program Managers (PMAs), Assistant Program Manager of Logistics (APMLs), Fleet Support Teams (FSTs), and anyone else involved in the acquisition and procurement of military equipment.

1. PERFORMANCE-BASED BUSINESS ENVIRONMENT (PBBE)

Performance-Based Business Environment (PBBE) is a process where government and contractor relationships capitalize on commercial practice efficiencies to improve military acquisition and sustainment. Under PBBE solicitations and contracts describe system performance requirements in a way that permits contractors greater latitude. The concept is described as a guide containing a set of 8 smaller documents that, in essence, provide the government and/or contractor the tools necessary to capitalize on commercial practice efficiencies to improve the military acquisition and sustainment environment. The new acquisition environment allows solicitations and contracts to describe system performance requirements in a way that provide contractors greater latitude, in contrast to historical acquisition methods, to use their own design and manufacturing ingenuity to meet the users needs.

The 7 documents comprising the PBBE Guide are briefly described below:

a. ***Integrated PBBE Guide (IPG)*** addresses overall business and technical strategies by providing top-level guidance for formulating or modifying acquisition strategies, developing Requests for Proposal (RFP)/contracts and conducting source selections. This guide illustrates how integrated performance-based products and process requirements, in any acquisition phase of the integrated total life cycle, achieve an executable, enforceable contract with provisions for necessary insight and risk management by government program management and contract administration offices.

b. ***Risk Management Pamphlet*** provides guidance to help program teams (both government and industry) establish and execute a framework for planning, assessing, handling and monitoring risks for all systems, subsystems, hardware, and software acquisition programs during all life cycle phases.

c. ***Flexible Sustainment (FS) Guide*** is intended to assist working-level managers to understand FS by addressing long-term operational and support (O&S) issues to effectively

maximize operational capability and optimize investment strategies while remaining under budget restraints.

d. ***Performance Based Product Definition Guide (PDG)*** describes the role of specifications, standards and technical data in support of a transition from current and past practices to a PBBE. It provides top-level guidance for the complete process to specify customer service requirements, allocate and translate technical information into specific design products and then set performance-based acquisition and support strategies.

e. ***Business Sector's Specifications Guide (JSSG)*** is intended to improve communication in and between government and contractor technical communities, in order to better convey desired end product capabilities.

f. ***Key Suppliers Processes (KSP) Handbook*** describes top-level, generic, key management processes for program execution by business sector suppliers to support system acquisition and sustainment.

g. ***Performance Risk Assessment Group (PRAG) Desk Guide*** is an evaluation tool that provides information for assessing a contractor's relevant past performance to assist the Government's Source Selection Authority.

2. FLEXIBLE SUSTAINMENT (FS)

The guide encourages the use of Performance-Based Specifications to develop innovative, cost effective life cycle solutions. The on-line automated FS Tool converts the "hard copy" FS Guide & Process into an Internet accessible tool to provide a methodology for Supportability decisions. The FS describes two major innovative follow-on processes for acquisition reform:

a. ***Reliability Based Logistics (RBL)*** suggests that developing the best "design for support" solution which increases the logistics reliability of a system can result in significant reduction of the maintenance support structure.

b. ***Trigger Based Asset Management (TBAM)*** is a cost-effective tool to enable the team to "support the design". It recommends the assessment of trends in the fielded systems and re-evaluation of maintenance plans when "triggers", such as changes in technology, reliability, maintainability, resources, etc., are detected.

The guide was updated Dec 98 and includes other cost effective life cycle support alternatives such as Open Systems, Depot Maintenance Decision Process, Logistics Management Information (LMI), Deficiency Reporting Process references, and TOC - Total Ownership Cost Guidance available at: http://www.nalda.navy.mil/jacg

3. DEFENSE ACQUISITION DESKBOOK (DAD)

The Deskbook is a hypertext tool with powerful search and display capabilities. It is a compilation of all of the latest Mandatory and Discretionary "Force" specific documents and DOD guidance on acquisition. A special interest section includes a Commercial Activities segment containing references to commercial practices and front line wisdom to "rightsourcing" life cycle support. It is an up-to-date tool that provides easy training and reference for new and experienced users. The Deskbook is readily available through the Internet and CD. Each is updated quarterly with the latest available changes to all documents.

4. MODELING AND SIMULATION (M&S)

A DoD 5000 directive emphasizing M&S "shall be used to reduce the time, resources, and risks of the acquisition process and to increase the quality of the systems being acquired." M&S highlight potential reductions in the expenditure of resources, accelerate understanding through early insight, and shorten overall cycle time. Acquisition citing references, accessible on-line via Deskbook on Process & Topics of M&S, directs the incorporation of M&S within program planning activities and the integrated application, support and reuse of M&S throughout the system life-cycle. Simulation Based Design (SBD) and Virtual Prototyping are also available as alternative M&S tools.

5. TOTAL OWNERSHIP COST (TOC)

The sum of all financial resources necessary to organize, equip, and sustain all military forces sufficient to meet national goals in compliance with all laws, all policies applicable to DoD, all standards in effect for readiness, safety and quality of life and all other official measure of performance for DoD and its components. DoD Total Ownership Cost (TOC) is comprised of costs to research, develop, acquire, own, operate, and dispose of weapons and support systems, other equipment and real property, the costs to recruit, train, retain, separate and otherwise support military and civilian personnel, and all other costs of business operations of the DoD. Defense Systems (as defined in DoD 5000.1) TOC is Life Cycle Cost (LCC) (as defined in DoD 5000.4-M). LCC (per DoD 5000.4-M) includes not only acquisition program direct costs, but also indirect costs attributable to the acquisition program (i.e., costs that would not occur if the program did not exist). For example, indirect costs would include the infrastructure that plans, manages and executes a program over its full life and common support items and systems. TOC contributes to the decision for the "right source" (organic or industrial) to be used and governs logistics acquisition and procurement procedures with that selected source.

Several tools and techniques are utilized for effective and efficient analysis of TOC.

a. ***Rightsourcing*** **-** pamphlet provides ideas, strategies and informative guidance for the government to pursue rightsourcing methodologies for procuring reduced TOC with organic or private organizations. Rightsourcing is a refinement of outsourcing, in which rightsourcing employs the processes commonly used for outsourcing but applies safeguards to assure there is no predisposition to either organic or outside sources at the expense of value. It has proven successful in both private industry and the government because it incorporates competition. For example, the Commercial Activities program has resulted in average savings of 30 percent (CNA reports 1993 & 1996).

b. ***Maintenance Trade Cost Guidebook*** **-** This guide has been prepared by the NAVAIR Cost Department (AIR-4.2.5) to assist in the preparation and evaluation of cost analyses of alternative maintenance concepts to reduce naval aviation operating and support (O&S) costs.

(1) Today's budget constraints are forcing Department of Defense (DoD) components to reexamine the way they conduct business. O&S costs represent a significant portion of naval aviation's Total Obligation Authority (TOA) and have been targeted for reduction in funding for modernization and re-capitalization efforts. Numerous studies have been prepared on alternative maintenance concepts that reduce O&S costs and many more

innovative proposals are under review. The objective of this guide is to assist in identification of the appropriate cost elements to consider, the best sources of critical data, and potential cost estimating methodologies.

(2) This version of the guidebook dated 31 October 1998 supplants the previous version dated 23 June 1998. Incorporated into this version is the NAVAIR/DLA preferred guidance for conducting Direct Vendor Delivery (DVD) business case analyses (BCAs). The main objective of DVD is to reduce O & S and logistics costs by shifting maintenance responsibilities, where appropriate, from the government to the private sector. The recommended data sources and guidelines for DVD cost analyses included in this version were developed through a cooperative effort between NAVAIR, NAVICP Philadelphia, and the DLA. Appendix I is a proposed cost element structure for use with DVD BCAs.

(3) The guidebook will be updated and improved as new information and tools are made available. The document is controlled by NAVAIR-4.2.5. Please provide any comments, questions or requests for this guide to NAVAIR-4.2.5 (POC: Andy Crepea, 301-342-2432). The central point of contact at NAVICP for DVD issues is LCDR James Hoover, SC, USN, (215) 697-2437. The Maintenance Trade Cost Guidebook is available at: www.navair.navy.mil/air40/air42/overview/reference/mtcg.doc

c. ***Cost As An Independent Variable (CAIV)*** - Methodology for reducing TOC that entails setting aggressive, realistic cost objectives and managing to those objectives while meeting customer requirements.

d. ***Cost Analysis Strategy Assessment (CASA)*** - A Life Cycle Cost (LCC) decision support tool that can present total ownership cost including RDT&E costs, production cost, and O&S costs.

e. Many software programs available for assessing TOC & LCC - to include: Open Architectural Retrieval System (OARS), Life Cycle Cost Analyzer (LCCA), and Decision Analysis and Resource Estimation (DARE).

There is an abundance of information located on the Internet at the following web pages in the area of Total Ownership Costs:

Air Force: http://www.aqf.drc.com/prod/html/default.htm

Navy: http://www.navsea.navy.mil/sea017/toc.htm
http://www.navair.navy.mil/toc/

Army: http://www.msrr.army.mil/

DoD: http://www.acq.osd.mil/ar/

6. ALPHA ACQUISITION

A. Alpha Acquisition is a concurrent versus serial approach which involves the integration of the Program/project/Acquisition Manager (PM/AM), the contracting Officer, the Contractor, the Defense Contract Audit Agency (DCAA), the Defense Contract Management Command (DCMC) and various field activities. The common goal is to acquire high quality goods and/or services for the Government in an expedited and efficient manner at a fair and reasonable price.

B. Government and contractor personnel are included in the acquisition process from the inception of the requirement. In order to accelerate the time it takes to award a contract once a requirement is known, the Integrated Product Team (IPT) goes to the Contractor's plant, where they work hand-in-hand with the contractor, DCAA, DCMC, and other units as necessary (i.e. DCMC Quality Engineers). Experience in past major procurements (exceeding $100M) shows that this process reduces to approximately four (4) months the time it takes from agreement on the Statement of Work (SOW) until contract award. Development of the SOW and specification, which normally takes about 126 days, is reduced by as much as 52 days (for consolidating responses, formal command review, data review board and delivery of a Procurement Initiation Document (PID). Duplication is eliminated from the procurement process because industry personnel are involved in the design, manufacturing and software development decisions of the RFP. Therefore, government research of, and response, to contractor issues are all resolved during the development of the SOW and specification. These members take ownership of the acquisition process from the beginning and become a Joint Industry/Government Team with a common purpose.

C. The benefits of the use of Alpha Acquisition practices are reduced procurement acquisition lead times and reduced costs. By including the DCAA and DCMC in the proposal preparation process their audits and technical evaluations can be completed more quickly since the need for follow-up audits and evaluations (generally driven by proposal updates) will be eliminated. The contractor benefits by significantly reducing proposal preparation costs.

D. Alpha Acquisition is a framework for expediting the acquisition process. The purpose is to eliminate any unnecessary processes and reviews, and to streamline and conduct the required ones in parallel. Nevertheless, the same issues addressed in standard procurements are addressed in Alpha Acquisition, the same questions asked, and the same support provided. However, it is all done much more quickly and started earlier in the process.

E. Alpha Acquisition is a labor-intensive process. For each such procurement, the IPT members may be out of the office for as much as 50 percent of the time over a period as long as a month of the total contracting time.

7. AWARD TERM CONTRACT

A. Award Term Contract is a relatively new concept evolved around performance accountability for meeting Warfighter requirements and assuring expected taxpayer savings. While the Department of Defense has recognized the potential benefits of long term contracts, there is also a fear associated with depending upon a sole source for an extended period of time. The award term contract offers a mechanism to minimize the risk of a sole source by increasing or decreasing the length of the contract based upon performance. The key to contract performance accountability is to have some type of incentive/penalty arrangements included in the contract that will focus management's attention on meeting the stated requirements of the contract. There may be a variety of financial and non-financial incentive/penalty concepts that could be applied fairly and equally to both the public and private sectors depending on the nature of the workload. Award Term Contracting is one such non-financial concept for performance accountability.

B. The Government and Contractor jointly develop contract specific Performance Areas and Associated metrics. For each performance area, metrics are developed and agreed upon in

advance. At the end of the evaluation period these metrics will be used to determine the Award-Term allocation. This is a dynamic process allowing refocus from year to year. The Award-Term arrangement will continue using the yearly evaluation period during any additional years awarded under the contract. This arrangement also allows the flexibility to the government, (agreed upon by both govt. and contractor), to change the evaluation criteria year to year if required by circumstances such as threat, mission, environment, etc. The flexibility of this design enables performance metric adjustments to accommodate the evolving requirements of the warfighter, such as those related to aging weapon system platforms, or changing combat scenarios.

C. One such Award-Term contract under solicitation at the time of this report plans to award a fixed- price-award-term requirement contract with economic price adjustments. The contract will have an initial ordering period of five years with a maximum of fifteen years for the line items the government expects to order. The evaluation criteria will be reviewed based on the following areas; Transition, Schedule, Affordability, Product Quality and Small Business Utilization.

8. BUSINESS CASE ANALYSIS

A comprehensive business case analysis (BCA) provides the foundation for making cost-effective decisions regarding the use of commercial aviation support for military weapon systems. However, a well-structured BCA also provides utility for fully defining the nature and scope of the application and transitioning from the current support to the new commercial application.

The BCA serves as an essential source of information regarding the impact that the proposed alternative will have on the current DoD support system. This data is critical to the decision-maker's assessment of not only the benefits of the new approach, but more importantly, the feasibility of re-aligning the current support system to fully realize the potential benefits.

In instances, where the decision is to go forward with a commercial support application, the BCA serves as a source of information that can be used to more fully define all parameters of the application, including the most cost-effective transition. The BCA can also serve as a source of cost and performance baseline data for structuring and managing the implementation of the application.

A BCA can be comprised of four distinct phases: (1) the development of the rough order of magnitude BCA; (2) the delineation of cost and performance baselines for the targeted area through a detailed business case analysis; (3) the development of a refined analysis based on discussion and input with potential industry partners and; (4) the structuring of the BCA as an application management tool.

A. *Phase I – The Development of the Rough Order of Magnitude BCA*

(1) The ROM business case analysis is structured to assess the "fit" of the particular commercial aviation support application to the military service(s) overall strategies, in general and weapon system programs and plans, in particular. In other words, is the particular commercial application aligned well with both the service strategies and objectives and the weapon system program's strategies and objectives? If so, how can this particular commercial initiative contribute to specific goals? For example, what specifically can this effort contribute to the Navy's Affordable Readiness goals? In

addition to weapon system's goals and objectives, there must also be a clear link to the operational commands (i.e. user's) evolving challenges, such as manpower reductions and changes in skill and training levels. The specific delineation of the effort's contribution to both the service strategies and weapon system program office objectives provides the basis for forming a joint partnership between the end users (operational commands) and the specific weapon system office for the further development of the commercial application, including the detailed business case analysis.

(2) The ROM BCA also provides an opportunity to present the various alternatives that may exist for the targeted commercial application area. In some cases, this may include various degrees of commercial applications, ranging from outsourcing total system support to just a few elements of support, such as material management or depot-level maintenance. In other cases, alternatives may include different types of commercial application transitions, such as 'turnkey" with immediate, total transition to a commercial support application or phased transitions occurring over several years.

(3) The basic business processes associated with the specific commercial application along with the current performance metrics for those processes are outlined as part of the ROM BCA. In addition, "best practice" metrics for the business processes are also identified. In order to assess the size of the targeted business base, a rough order of magnitude estimate of the workload is also developed based upon recent, representative workloads for the targeted application area.

(4) The specific approach for the detailed business case analysis is also proposed as part of the ROM BCA. This provides an opportunity for all participants, including executive management in all organizations that would potentially be impacted by the commercial application, to review, assess and contribute to the metrics, analysis and approach.

(5) Lastly, even at this early stage of a ROM BCA, any potential risks associated with the particular commercial application or commercial application's in general, based on experience to date, are fully defined along with recommended risk management mechanisms.

B. ***Phase II - The Delineation of Cost and Performance Baselines for the Targeted Area – The Detailed Business Case Analysis***

(1) In this phase of the analysis, the operations of all DoD activities impacted by the proposed commercial support application, not just the lead activity or organization is addressed. The draft Memorandums of Understanding developed during Phase I serve as the foundation for identifying and incorporating all stakeholders.

C. ***Phase III - The Development of a Refined Analysis Based on Discussion and Input with Potential Industry Partners***

(1) The approval of an alpha acquisition approach enables the development of a more refined BCA based on discussions and input from various industry partners. In this process, information is shared regarding the DoD's customer's performance metrics, the current DoD cost and performance baselines and industry's potential improvements to those baselines. Based upon this, a more refined evaluation of preferred options and approaches to both the structure of the application and the nature of the transition can be developed.

D. ***Phase IV - The Structuring of the BCA as an Application Management Tool***

(1) The BCA as it evolves through the various phases becomes a living document and database. If this information is properly structured, it can also serve as a management tool for guiding and evolving the transition and implementation of the commercial application. Unanticipated problems can be assessed based upon the cost and performance baselines and modifications can be more easily structured. The BCA can also serve as an assessment tool for evaluating actual to planned performance levels.

9. ORGANIZATIONAL ISSUES

DoD needs to develop Acquisition Reform training to include many of the newest subjects, i.e., Alpha Acquisition, Open Systems, Single Process Initiative, Affordable Readiness, Flexible Sustainment, Electronic Proposal Evaluation Process, Modeling & Simulation, Business Case Analysis, Total Ownership Cost, Core, etc.

10. COST TO PRICE APPROACH

The transition to commercial aviation support and the application of performance-based logistics will require a change in how DoD establishes and maintains its business relationships with its industry partners. DoD through its traditional logistics support systems and processes has established business relationships which are based on the cost of products and services that contribute in some way to the maintenance and support of its weapon systems. While the focus has always been on obtaining the best product or service at the lowest possible cost the aggregation of all the lowest cost items and services could often result in a very high "priced" weapon system support system.

In other words, numerous organizations have specific roles in providing their "piece of the support effort"; the performance goals of those activities may not represent a good indicator of their contribution to the system support goals and objectives. For example, the performance goal of a maintenance organization, whether organic or private, may have been the cost per maintenance hour. However, the price of the support would be more appropriately measured by the number of hours that the maintenance activity required to repair the item and the turn around time of the maintenance activity. Taken to a higher level, the total price of maintaining aircraft at a set level of readiness (i.e. availability) may be a much more effective approach. If one organization was incentivized through a set price to maintain given readiness levels, the cost and value added of each and every support activity would be managed in a way that achieved that level of support at the lowest possible cost.

As DoD moves to a performance-based support environment, DoD will need to re-focus it's business relationships on clearly specified and measurable levels of performance at given (i.e. set) prices. DoD will need to "let go" of the cost management and oversight of steps in the support process, and instead focus on negotiating fair and reasonable prices that are based on performance-based output measurements and not on the cost of components. The latter is a much more challenging task than the former. DoD procurement personnel will need to be trained on commercial pricing practices to enable this type of transition. DoD, overall, will need to re-engineer some aspects of its approach to budgeting and planning which tended to be heavily driven by the cost of products and services versus the price of capabilities.

11. SUMMARY AND FINDINGS

The relevance of these available tools for commercial support is that they are living and dynamic documents for the fundamental understanding and guidance towards a joint implementation between the government and industry for improved affordable system readiness of the fleet. These acquisition tools primarily act as 'how to' guidebooks, disseminated to the working groups who are involved in implementing certain acquisition programs. In particular, when the leadership is in a state of flux, these existing tools provide a degree of stability in the way of doing business. A substantial amount of effort has been contributed in making these acquisition tools user-friendly and up-to-date to foster current, or prospective, acquisition reform processes. These documents, however, are not in any way to substitute for courses in logistics, engineering and contracting.

The application of these tools that drive successful acquisition reforms involves leadership, communication and training. Strong and active leadership provides the impetus for reform to occur. Leaders should emphasize the presence and relevance of the existing material for acquisition reform and encourage that the team and/or organization utilize these sources for efficient implementation of the acquisition system. Communication amongst leaders and the workforce is important for informing each other that the reform process and implementation is taking place. The sharing of information between government and industry who are also experiencing similar re-organization of their infrastructure is important for mutual partnership of commercial aviation services and products. Eventually, necessary training of the workforce and the leaders themselves about the new processes will better prepare the organizations for the upcoming changes, with the tools at hand for easy access and referencing. Failure to convey the information about the available material would be an impediment to the success of the program and the joint efforts of industry and military services.

In another area, acquisition reform has not addressed the unique problems associated with service contracts. For example, DoD contracting officers frequently lack adequate expertise in the service being procured. Because of this lack of functional expertise, they often do not have a comprehensive understanding of the contract terms and conditions that are most needed to be effective for a particular service. Moreover, industry reports that DoD continues to base vendor selection primarily on hourly labor rates and not on past performance, reputation, and reengineering potential. The DoD procurement process also fosters formalized, distant, and sometimes adversarial relationships between industry and DoD contract oversight personnel. Private sector experience suggests that an interactive, more collaborative approach is key to effective management of complex service contracts. Finally, in the current environment there are few incentives for the military services to pursue an aggressive outsourcing program. The Services, and individual programs, feel that savings achieved from outsourcing are likely to be diverted to other functions, which is indeed the case if funds are to be found for modernization and recapitalization.

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SECTION V

THE CURRENT BUSINESS RULES

How do we conduct the business of aviation support?

1. DOD GUIDANCE – 5000 SERIES

A. ***Background.*** For nearly 25 years, Department of Defense (DoD) Directive 5000.1 and Regulation 5000.2 have been centerpieces of defense acquisition policies and procedures. These documents describe a disciplined management approach for acquiring systems and materiel to satisfy valid military needs. Since 1971, when the first DoD Directive 5000.1 was issued, the documents have been revised to reflect new priorities and the nation's evolving acquisition policies. As part of the acquisition reform initiative, an updated Directive and Regulation that integrates the 5000 series was issued. The intent of the revision was to define an acquisition environment that makes DoD the smartest, most responsive buyer of the best goods and services that meet our warfighters' needs, at the best dollar value over the life of the product. Copies of the directive can be retrieved via the Internet at http://www.acq.osd.mil/api/asm/product.html.

B. ***Scope.*** Directive 5000.1 and Regulation 5000.2-R provide mandatory policies and procedures for the management of acquisition programs, except when statutory requirements override. It describes broad management principles that are applicable to all DoD acquisition programs.

C. ***Purpose.*** The DoD 5000 is a wide-sweeping effort that streamlines the method by which the Department of Defense purchases assets. Assets are defined as purchases such as "jet fighters", "aircraft carriers", and all of the individual parts that make these vehicles function reliably. Any organization that sells equipment to the government must follow specific rules. Amongst these procedures are supplemental recommendations, suggested guidelines, and/or other mandatory rules that may only apply in specific circumstances. The process is very involved, but it is in place to ensure that the government buys the highest quality equipment for the lowest possible price, while in compliance with United States Law.

D. ***Discussion.*** The policies stated are intended to forge a close and effective interface among the Department's three principal decision support systems: (a) the Requirements Generation System, (b) the Acquisition Management System, and (c) the Planning, Programming, and Budgeting System. As part of the Requirements Generation System, it is imperative to work with program sponsors and PMA/PEO to include the principles of this document into the ORD and Acquisition Strategy Planning documents. The acquisition management system governed by this Directive provides for a streamlined management structure and event-driven management process that emphasizes risk management and affordability and that explicitly links milestone decisions to demonstrated accomplishments. The planning, programming, and budgeting system provides the basis for making informed affordability assessments and resource allocation decisions on defense acquisition programs. All three systems operate continuously and concurrently to assist the Secretary of Defense and other senior officials in making critical decisions.

E. Acquisition programs shall establish logistics support concepts (e.g., two level, three level) early in the program and refine them throughout the development process. Life-cycle costs shall play a key role in the overall selection process. Support concepts for new and future

weapon systems shall provide for cost effective total life-cycle logistics support. Supportability factors are integral elements of program performance specifications. However, support requirements are not to be stated as distinct logistics elements, but instead as performance requirements that relate to a system's operational effectiveness, operational suitability, and life cycle cost reduction.

F. DoD policy to maintain systems has been changed to stress "core" capabilities. It is DoD policy to maintain adequate organic core depot maintenance capabilities to provide effective and timely response to surge demands, ensure competitive capabilities, and sustain institutional expertise. Support concepts for new and modified systems shall maximize the use of contractor provided, long-term, total life-cycle logistics support that combines depot-level maintenance for non-core-related workload along with wholesale and selected retail materiel management functions. Best value over the life cycle of the weapon system and use of existing contractor capabilities, particularly while the system is in production, are key determinants in the overall decision process. Program Managers are required to provide for long-term access to data required for competitive sourcing of systems support throughout its life cycle.

G. Section 3.3.8 of DoD 5000.2, states, “Support concepts for new and modified systems shall maximize the use of contractor provided, long-term, total life-cycle logistics support that combines depot-level maintenance for non-core-related workload along with wholesale and selected retail materiel management functions. Best value over the life cycle of the weapon system and use of existing contractor capabilities, particularly while the system is in production, shall be key determinants in the overall decision process. The PM shall provide for long-term access to data required for competitive sourcing of systems support throughout its life cycle.”

2. STATUTES

A. The following stipulations are cited within the United States Code for legal provisions that impact the process for the allocation of depot maintenance, modification and upgrade workload within the Department of Defense. Listed also are provisions from the FY98 National Defense Authorization Act, the FY98 National Defense Appropriations Act and the names of several recent acquisition reform laws that have bearing on system support policy within DoD. A more extensive analysis and discussion of those legal provisions that are viewed by many as impediments to effective and efficient management of defense system support resources are discussed in the Legislative Directions section of Chapter VII of this report, “Barriers to Implementing Cost Effective Aviation Support.” It is important that program managers understand the implications of these statutes and develop commercial support initiatives that will be executable.

10 USC 2460 – Defines “depot-level maintenance and repair as material maintenance or repair requiring the overhaul, upgrading, or rebuilding of parts, assemblies, or sub-assemblies, and the testing and reclamation of equipment as necessary, regardless of the source of funds for the maintenance or repair.”[7] This term includes (1) all aspects of software maintenance as depot-level maintenance and repair, and (2) interim contractor support or contractor logistics support (or any similar contractor support), to the extent that such support is for the performance of services described in the preceding sentence.

10 USC 2461 – Stipulates that commercial or industrial type functions performed by more than 45 civilian employees may not be converted to contractor performance until the

[7] “Title 10—Armed Forces, Subtitle A—Gen. Military Law See Appendix D, reference #37, pg. 120.

Secretary of Defense has provided to Congress a specific notice, cost comparison, certification and report.

10 USC 2462 – Requires purchase of supplies and services from the private sector when the cost of such supplies and services is lower than that of the government provider. Requires realistic and fair cost comparison between public and private providers.

10 USC 2463 – Requires reports regarding savings or increased costs resulting from increased use of DoD civilian personnel.

10 USC 2464 – Requires DoD to maintain a 'CORE' logistics capability and prohibits contracting out of that 'CORE' capability or function.

10 USC 2465 - Prohibits the outsourcing of firefighting or security guard functions and activities currently performed at any military installation.

10 USC 2466 – Stipulates that not more than 50 percent of the funds available in a fiscal year to a military department or a defense agency for depot-level maintenance and repair workload may be used to contract for the performance by non-Federal government personnel of such workload for the military department or defense agency.

10 USC 2468 – Provides authority to Commanders of military installations to decide which activities shall be reviewed under the provisions of OMB Circular A-76.

10 USC 2469 – Requires that depot-level maintenance or repair workload valued at $3 million or more that is selected for reassignment to a private sector entity must first be the subject of a public/private competition.

10 USC 2470 – Provides authority for depot-level activities within the DoD to compete for maintenance and repair workloads of other Federal agencies.

10 USC 2471 – Provides authority for lease of excess depot-level equipment and facilities by persons outside of the DoD.

B. Following are provisions of the FY98 National Defense Authorization Act that are pertinent to the implementation of depot maintenance and system support policy:

(1) Sec. 341 amends 10 USC 2460 (a) to require location to be part of the determination of depot-level maintenance and repair for the purpose of computing the 50/50 workload allocation between public and private providers. This requires that work performed by private contractors on public facilities be counted toward the private sector 50 percent of workload headroom.

(2) Sec. 342 amends 10 USC 2461 to expand the scope and coverage of reporting requirements that DoD must make to the Congress before commercial or industrial type functions can be changed from government to contractor performance.

(3) Sec. 343 amends 10 USC 2464 to require DoD to submit to Congress a notification and justification the first time that a weapon system or other item of military equipment is determined to be a commercial item for the purpose of granting a commercial item exception in regard to DoD procurement policy.

(4) Sec. 346 prohibits the Secretary of Defense or the head of a military department from entering into a prime vendor contract for depot-level maintenance or repair of a weapon

system or other military equipment prior to the end of a 30 day waiting period following the submission to Congress by DoD of a report describing the nature, cost impact and competition procedures used to award the prime vendor support contract.

(5) Sec. 347 requires the Secretary of each military department to submit to the Congress a report on best commercial practices for the acquisition and distribution of secondary supply items managed by that military department.

(6) Sec. 351 requires that not later than March 1, 1999, the Secretary of the Air Force submit to Congress a plan for the establishment of a core logistics capability for the C-17 aircraft consistent with the legal requirement for the retention of a core maintenance capability within the government.

C. Following is a provision of the FY99 National Defense Appropriations Act that is relevant to the implementation of depot maintenance and system support policy:

(1) Sec. 8037 grants authority during the current fiscal year for DoD to acquire modification, depot maintenance and repair of aircraft, vehicles and vessels as well as the production of components and other Defense-related articles through competition between DoD depot maintenance activities and private firms provided that the Department certifies that successful bids include comparable estimates of all direct and indirect costs for both public and private bids. The section further stipulates that OMB Circular A-76 shall not apply to such competitions.

D. Recently enacted acquisition reform laws that have potential bearing on the implementation of DoD system support policy:

- The Federal Acquisition Streamlining Act of 1994
- The Federal Acquisition Reform Act of 1995
- The Federal Activities Inventory Reform Act of 1998

3. MAINTENANCE OF MILITARY MATERIAL, DOD DIRECTIVE – 4151.18

A. ***Background.*** In the early 1990s, the Department of Defense (DoD) found itself entangled in a "web" of conflicting and sometimes redundant policies and directives, which address the tasks of maintenance on military equipment. It became incumbent upon the then-Secretary of Defense to initiate a complete review of the existing maintenance processes, and the associated documentation that govern them. A streamlining process, one of whose goals was to clearly restate policy and define and delegate responsibilities, was thus undertaken. DoD Directive 4151.18 (D) is but one product of this total process. Copies of this directive can be retrieved via the Internet at http://www.acq.osd.mil/log/mp.

B. ***Scope.*** This directive applies to the Office of the Secretary of Defense, the Military Departments, the Joint Chiefs of Staff and the Joint Staff, the Unified and Specified Commands, the Defense Agencies, and the DoD Field Activities (collectively referred to as the DoD Components). The responsibility for compliance with this directive has been delegated to the Under Secretary of Defense (Acquisition), who reviews adequacy of funding and maintenance support programs, by the components.

C. ***Purpose.*** The purpose of this directive to replace the below listed DoD references:

(1) DoD Directive 4151.1, "Use of Contractor and DoD resources for Maintenance of Materiel," dated 15 Jul 82

(2) DoD Directive 4151.15, "Depot Maintenance Support Programming Policies," dated 22 Nov 76

(3) DoD Directive 4151.16, "DoD Equipment Maintenance Program," dated 23 Aug 84

(4) DoD Instruction 4151.17, "Overseas Depot Maintenance," dated 16 Jul 85

(5) DoD Directive 5025.1-M, "DoD Directives System Procedures," dated Dec 90

(6) DoD Instruction 5000.2, "Defense Acquisition Management Policies and Procedures," dated 23 Feb 91

(7) DoD Directive 5128.32, "Defense Depot Maintenance Council," 07 Nov 90

(a) This directive establishes the policy and assigns the responsibilities for the performance of DoD materiel maintenance, including maintenance of hardware, equipment, software, or any combination thereof, at all levels (organizational, intermediate, and depot), and for both organic and contract. It also authorizes the publication of DoD 4151.18 (H), "Depot Maintenance Capacity and Utilization Measurement Handbook," dated 24 Jan 97, IAW DoD 5025.1 (M), "DoD Directives System Procedure," dated 15 Aug 94.

D. ***Discussion.*** This directive requires an adequate program for maintenance of assigned materiel (at all maintenance levels). As a minimum, it mandates compliance for all readiness objectives through the use of the lowest level of maintenance practicable, which ensures optimum readiness and economic use of resources. It mandates the identification of a program's Depot Maintenance Source-of-Repair within 90 days of an Engineering and Manufacturing Development (EMD) contract award. Furthermore, it standardizes maintenance tooling, test equipment and software for similar workloads. This policy requires an adequate program which mandates: (a) Competition between and among DoD depot level maintenance activities and private entities, to achieve economies and efficiencies in maintenance of military materiel; (b) Inter/Intra-Service and joint contracting maintenance support arrangements, which achieve the most cost-effective depot maintenance possible, consistent with readiness requirements of the Services; (c) Depot maintenance skills and resource base be maintained within depot activities to meet military contingency requirements.

4. NAVAL AVIATION MAINTENANCE PROGRAM – NAVAIR INST 4790.2

A. ***Background.*** The NAMP provides an integrated system for performing aeronautical equipment maintenance and related support functions. It was established by the Chief of Naval Operations (CNO) and implemented by the Chief, Bureau of Aeronautics, on 26 October 1959. Because of the dynamic nature of the program, the NAMP has been periodically revised to incorporate improved methods and techniques. The current revision of OPNAVIST 4890.2G, dated Feb 1998, is available on CD-ROM and via the Internet at: http//www.nalda.navy.mil/4790/.

B. ***Scope.*** NAMP policy applies to all organizations involved with the operation and support of Navy and Marine Corps aircraft. Additionally, it is applicable to equipment under the Aircraft Maintenance Materiel Readiness List Program. Specifically excluded from the

provisions of this instruction are air launched weapons, armament weapons support equipment, missile targets and items of installed shipboard and shore-based equipment, such as launch and recovery equipment, optical landing systems or other similar equipment. Questions regarding individual equipment applicability shall be forwarded to CNO (N881) for determination. In instances where the NAMP is specifically cited in contracts, the contract language should state that the currently effective edition of this instruction should apply in whole or part, as specified.

C. ***Purpose.*** This instruction provides the maintenance policies, procedures, and responsibilities for the conduct of the NAMP at all levels of maintenance throughout naval aviation. The NAMP provides for the maintenance, manufacture and calibration of aeronautical equipment and materiel at the level of maintenance, which will ensure optimum use of resources. It further provides for the protection of weapon systems from corrosive elements through an active corrosion control program, and the application of a systematic planned maintenance program. Finally, it provides for the collection, analysis, and use of pertinent data to continuously improve materiel readiness and safety at the least possible cost. The objective is to meet and exceed aviation readiness and safety standards established by CNO. This is accomplished by optimizing the use of manpower, materiel, facilities, and financial resources in accordance with policy guidance and technical direction provided by this instruction and by related implementing directives.

D. ***Discussion.*** This instruction outlines command, administrative and management relationships and establishes policies and procedures for the assignment of maintenance responsibilities and tasks. It is the basic document and authority governing the management of all naval aviation maintenance. The NAMP is divided into 5 distinct volumes Volume I addresses concepts, policies, organizations, maintenance, support procedures, organizational and intermediate level maintenance. Volume II addresses depot level maintenance. Volume III deals with maintenance data systems. Volume IV contains data processing requirements. Volume V addresses standard operating procedures.

5. MAINTENANCE MANAGEMENT OF AIRCRAFT -- AIR FORCE INSTRUCTIONS 21-101 and 21-102

A. ***Background.*** AFI-21-101, Maintenance Management of Aircraft, and AFI 21-102, Depot Maintenance Management, implement the policies contained in Air Force Policy Directive (AFPD) 21-1, Managing Aerospace Equipment Maintenance. AFI 21-101 provides the basic instructions that enables the United States Air Force (USAF) to prudently manage resources while meeting the need to mobilize and deploy. AFI 21-102 provides the guidance for USAF depot maintenance management and surge capability. AFI 21-101 replaces Air Force Regulations (AFR) 66-1 and 66-33 that previously provided the guidance for the USAF aircraft maintenance program and AFI 21-102 replaced AFR 66-3, 66-7, and 66-11 that provided the guidance for depot management. Headquarters, USAF Logistics (HQ USAF/LG) oversees aircraft maintenance at all levels, from the maintainers on the flight line and in the back shops through the technicians in the depots. HQ USAF/LG is the cognizant organization that issues and revises AFI 21-101 and AFI 21-102. All of these instructions, as well as other related Air Force instructions are available on the Internet at: http://afpubs.hq.af.mil.

B. ***Scope.***

(1) AFI 21-101 applies to all USAF organizations involved with the operation and support of aircraft and aircraft related support equipment. AFI 21-101 requires that equipment be strictly maintained in accordance with appropriate technical manuals and that high-

quality, system-specific training programs be utilized to insure that equipment is serviceable, safe and available for sustained use. This instruction provides minimum requirements needed to track the condition and location of aircraft and support equipment. AFI 21-101 also guides both corrective and preventative maintenance programs used by the USAF. Waiver authority for deviations from AFI 21-101 is Headquarters, USAF Logistics-Maintenance (HQ USAF/LGM).

(2) AFI 21-102 applies to all USAF organizations involved with Depot Maintenance activities to include the Air Logistics Centers. This instruction directs Air Force Material Command (AFMC) to develop and maintain a depot maintenance support for depot maintenance planning during peacetime periods of increased tension and emergencies. Waiver authority for deviations from AFI 21-102 is Headquarters, USAF Logistics-Maintenance (HQ USAF/LGM).

C. ***Purpose.***

(1) AFI 21-101: This instruction provides the minimum essential guidance and procedures to safely and effectively maintain, service, and repair USAF aircraft and support equipment at the base level. The objective is to properly maintain assets (aircraft and support equipment) and have them available to meet operational needs at reasonable costs. This is accomplished by optimizing the use of manpower, material, facilities and financial resources in accordance with policy guidance and technical direction provided by this and related instructions and directives.

(2) AFI 21-102: This instruction provides guidance and procedures for management of Air Force Depot Activities. In addition it develops and maintains a methodology for assessing organic depot maintenance minimum level requirements and making depot maintenance source of repair (SOR) determinations in accordance with criteria established by DoD Directive 4151.18 and this instruction. Develops financial planning and prepares budgets for depot maintenance programs. Manages a program to acquire modern depot facilities and equipment, including new technologies, production enhancements, and development of consolidated support facilities essential to meet logistics support needs of the Air Force. Develops and maintains a surge contingency plan.

D. ***Discussion.*** These instructions are primarily responsible for outlining guidelines and policy for organic support of USAF assets. AFI 21-101 incorporates a section on managing contract maintenance to include assigning responsibility for policy and procedures to AFMC HQ and assigning an Air Logistics Center as the focal point for contractual issues. AFI 21-102 also incorporates a section on the use of Contractor Logistics Support (CLS) in the Source of Repair selection process. This section explains the different CLS support concepts in accordance with AFI 63-111, Instruction for Contractor Support for Systems and Equipment. AFI 63-111 (currently in rough draft format) will be the governing policy for Contractor Support on USAF assets. Air Force Instruction 21-107, Maintenance of Commercial Derivative Aircraft deals specifically with commercial derivative aircraft such a KC-10, T-6 Texan, and the C-21.

6. Army Materiel Maintenance Policy and Retail Maintenance Operations – Army Regulation 750-1

A. ***Background.*** Army Regulation 750-1 establishes policies and assigns responsibilities for the maintenance of Army materiel. It also provides and defines requirements for

performance and management of the materiel maintenance function. The current version of the regulation is dated 1 July 1996.

B. ***Scope.*** AR-750-1 applies to unit, direct support, and general support levels of the Army maintenance system and Army wide program and commodity unique maintenance. This regulation defines organizational responsibilities for maintenance, maintenance policies and structure, maintenance operations and commodity-oriented maintenance policies. Maintenance for Army aircraft is defined in Part 5.0, section IV.

C. ***Purpose.***

(1) This regulation provides policy regarding general maintenance policies and specific objectives for aviation maintenance. The regulation states that the Army has one maintenance standard that is based on TM 10 and 20-series PMCS. This standard applies to all equipment except equipment used as training aids and frequently disassembled and assembled for instructional purposes. The regulation also states that general maintenance policy is that "the top design priorities in the development of new weapon and equipment end items are modular design and discard at failure instead of repair"[8] and that "maintenance support programs will be structured to meet material system readiness objectives."[9]

(2) The Army regulation also defines the objective of Army aviation maintenance as follows: "to ensure safe, reliable, and full mission capable aviation weapon systems."[10] In order to accomplish this, three levels of aviation maintenance are utilized – the aviation unit maintenance, the aviation intermediate maintenance, and the aviation depot maintenance.

D. ***Discussion.***

(1) The Army regulation provides specifics on the organization, structure and policies that form the basis of Army aviation maintenance. While not specific to aviation maintenance, the Army does provide specific policy on the performance of maintenance stating that " maintenance will be performed by military personnel in areas forward of the corps rear boundary. Contractors/contracted maintenance will not normally be allowed for unit or DS levels of maintenance."[11] The Army also states four specific situations when maintenance by contract personnel will be prohibited. These are when: (1) the maintenance workload is required for training; (2) a satisfactory commercial source is not available and cannot be developed in time to meet requirements; (3) contract maintenance will result in higher cost; and (4) the product or service is available from another DoD component or another Federal department or agency. In those instances when commercial sources are chosen, the Army regulation requires that specific contractual provisions for obtaining contractor conformance, such as award and incentive fee provisions for meeting performance, quality and cost standards be used.

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[8] "Army Depot Maintenance, Privatization Without Further Downsizing Increases Costly Excess Capacity" See Appendix D
[9] "Army Depot Maintenance, Privatization Without Further Downsizing Increases Costly Excess Capacity" See Appendix D
[10] "Army Depot Maintenance, Privatization Without Further Downsizing Increases Costly Excess Capacity" See Appendix
[11] "Army Materiel Maintenance Policy and Retail Maintenance Operations - Army Regulation 750-1"

(2) The Army regulation also includes an appendix of maintenance performance measures to assist the unit commander and maintenance shop officer in their evaluations. These metrics include: utilization rates; material readiness rates; workload; direct labor availability; efficiency rates; turnaround times; maintenance delay times; supply delay time; repair cycle time; backup support utilization; maintenance float utilization; and rejection rate.

7. DEFENSE LOGISTICS AGENCY (DLA) SUPPLY SUPPORT

A. ***Background.*** The Defense Logistics Agency (DLA) is a Combat Support Agency of the Department of Defense (DoD) under the authority, direction, and control of the Under Secretary of Defense (Acquisition and Technology) in accordance with Title 10, United States Code. DLA provides worldwide logistics support for the missions of the Military Departments and the Unified Combatant Commands under conditions of peace and war. DLA furnishes logistics services directly associated with the supply management function and other support services including scientific and technical information, federal cataloging, industrial plant equipment, reutilization and marketing and systems analysis, design, procedural development and maintenance for supply and service systems. The Base Realignment and Closure (BRAC) in 1993 determined the Defense Supply Center Richmond (DSCR) would function as lead Inventory Control Point (ICP) for all military aviation supply support. As an integral element of the military aviation logistics system of the Department of Defense, DSCR is tasked with providing effective and efficient worldwide logistics support.

B. ***Scope.*** DoD 5000 directives in conjunction with DLA Manual 4140 provide mandatory policies and procedures in the forging of a close and effective interface among supply operations. DLA Manual 4140 is published in three volumes. Volume I contains the policies and procedures for the DLA distribution system and describes the interrelationship among the Defense Supply Centers (DSC's) and distribution activities (i.e. distribution depots, attrition depots, specialized support depots, and direct supply support points). Volume II prescribes the Standard Automated Materiel Management System (SAMM's) Procedures internal to DSC operations and functions for determination of requirements, requisition processing issues, distribution, and inventory accounting of materiel, on a centralized basis. Volume III prescribes the Mechanized Warehousing and Shipping Procedures for supply operations as DSA managed distribution activities (defense depots and DSCs with co-located storage activities). In conjunction with these standards, the Commander DLA is specifically delegated to meet the needs of the Military Departments by conducting, directing, supervising, or controlling all procurement activities regarding property, supplies, and services assigned to DLA in accordance with the Federal Acquisition Regulation (FAR), and DoD Federal Acquisition Regulation Supplement (DFARS).

C. ***Purpose.*** DoD directive 5105.22, and DLA Manual 4140 describe the supply support policies, procedures and responsibilities for DLA at all levels. Pursuant to these instructions, DLA today is comprised of five distinct, but related business management areas. The five business areas are: Supply Management, Distribution Management, Reutilization, Marketing and Disposal Management, Logistics Information Products Management, and Defense National Stockpile Management. The Supply Management business area is responsible for overall coordination of supply support for consumable items assigned by DoD to DLA, including requirements determination, acquisition of inventories and/or establishment of direct customer access to commercial sources, and stock control. Currently, Supply Management controls over 4 million items grouped into five commodity areas of which the air and space systems divisions are managed by DSCR.

The Distribution Management business area is responsible for receipt, storage, issue, packing, preservation and transportation arrangements for all items placed under its accountability by DLA and Service ICPs. The Reutilization, Marketing and Disposal Management business area is responsible for the disposition of DoD property turned in by DoD activities. The Logistics Information Products Management business area is responsible for managing the Federal Catalog Systems (FSC), containing data for nearly 7 million items used by DoD, NATO and other customers. The Defense National Stockpile Management business area is responsible for the management and phased liquidation, of the $6 billion inventory of more than 90 critical and strategic materiel commodities through the Defense National Stockpile Center and its field locations. Together these five business areas form the essential elements of today's operational supply chain supporting military weapon systems, as well as of the life cycle management of those systems. DLA is responsible for locating, establishing necessary contractual vehicles, and ensuring distribution on consumable materiel to customers, as well as coordinating the distribution of repairable and selected principle items. Additionally, DLA manages inventories, ensures industrial base capabilities, provides continuous supply support, and ultimately disposes of residual materiel throughout the life cycle of military weapons systems.

D. ***Discussion.*** DLA must meet focused logistics specifications as well as respond to increased logistics demand criteria required by Program Managers who are developing new weapon systems and support equipment, which require fast, flexible, reliable service at reasonable costs. In addition, DLA must provide clear and easy communications for access to available services; develop performance standards and costs which allow valid comparisons against alternate acquisition sources; and provide access to accurate and timely information concerning logistics processes. DLA is working to integrate wholesale and retail logistics information systems and to ultimately integrate the entire supply chain from battlefield diagnostics to order entry. Coordination and linkage among all levels of the supply chain, both within DLA and in consonance with the military services will be a critical element to overcome to achieve success. The accomplishment of this task will benefit the following linkages: supply and distribution, requirement determination and acquisition, distribution and transportation, supply and maintenance, supply and engineering, and strategic lift and in-theater distribution.

8. Summary and Findings

DoD's business rules for aviation maintenance are based upon internal policies and guidance and Congressional statutes. All of the military services and the Defense Logistics Agency have unique policies and approaches to aviation maintenance policy. It is unclear if the policy guidance from the DoD 5000 series is carried through sufficiently in the service's policies and directives. Potential applications of commercial aviation concepts and processes must consider the business rules, which the Department is currently applying to defense maintenance activities.

SECTION VI

DETERMINATION OF CORE REQUIREMENTS

What is our "core" aviation support business?

1. OSD GUIDANCE AND DIRECTION REGARDING CORE

A. DRAFT OSD Policy regarding the FY-98 National Defense Authorization Act dated 3 Apr 1998.

B. DoD 5000.2-R with Change 2, Mandatory Procedures for MDAPs and MAIS Acquisition Programs of 6 Oct 1997.

(1) 3.3.7 - Source of Support. It is DoD policy to maintain adequate organic core depot maintenance capabilities to provide effective and timely response to surge demands, ensure competitive capabilities, and sustain institutional expertise. Support concepts for new and modified systems shall maximize the use of contractor provided, long-term, total life-cycle logistics support that combines depot-level maintenance for non-core-related workload along with wholesale and selected retail materiel management functions. Best value over the life cycle of the weapon system and use of existing contractor capabilities, particularly while the system is in production, shall be key determinants in the overall decision process. The PM shall provide for long-term access to data required for competitive sourcing of systems support throughout its life cycle.

C. Under Secretary of Defense Paul G. Kaminski's memo of 17 Jan 1997, Subj: Designation of the Defense Depot Maintenance Council as the Single Manager Element for Aircraft Maintenance.

(1) The Deputy Secretary of Defense designated the Defense Depot Maintenance Council (DDMC) as the Single Manager Element (SME) for Aircraft Maintenance in his decision memorandum dated September 11, 1996. This memorandum provides guidance regarding DoD implementation of the Deputy Secretary of Defense decision and establishes the scope, procedures and requirements of implementing the SME for Aircraft Maintenance.

D. Deputy Under Secretary of Defense (Logistics) John F. Phillips' memo of 1 Feb 1996, Subj: Agreements and Assignments (A&As) from the January 30, 1996, Defense Depot Maintenance Council (DDMC).

(1) Core Methodology - The council approved the standardized core methodology previously coordinated among the services, including the consensus that the services should immediately undertake recomputation of required organic capability.

E. Deputy Under Secretary (Logistics) James R. Klugh's memo of 15 Nov 1993, Subj: Policy for Maintaining Core Depot Maintenance Capability.

(1) This was a policy statement that defined depot maintenance core and provided the first DoD approved methodology to compute core depot maintenance requirements.

F. DoD Directive 4151.18 of 12 Aug 1992, Subj: Maintenance of Military Materiel.

(1) The Heads of the DoD Components shall: Annually determines and quantifies (using a USD(A) - approved methodology) the core capability necessary to perform mission-essential depot maintenance to meet the full range of military contingencies and statutory requirements.

G. Assistant Secretary of Defense memo of 8 Nov 1990, Subj: Defense Depot Maintenance Council Meeting Minutes, October 9, 1990.

(1) "Core" Depot Maintenance Policy statement prepared under the leadership of Diane K. Morales, Deputy Assistant Secretary of Defense (Logistics). This resulted in a data call to the services to identify and quantify core capability requirements.

2. NAVAIR CORE DETERMINATION PROCESS AND RESULTS

NAVAIR (AIR-6.1.3.2) applies the DoD Core Methodology as well as the factors contained in the November 1997 public law (10USC2464). Core capability requirements are expressed in direct labor hours (dlhs) for the categories of Aircraft, Engines, Components, and other submitted to N431 for staffing to the Deputy Under Secretary of Defense (Logistics).

3. U.S. AIR FORCE CORE DETERMINATION PROCESS AND RESULTS

A. Law-10 USC 2464, requires a core logistics capability. Core is depot repair capability (Government facilities, equipment and employees) maintained to meet readiness and sustainability for tasked weapons/equipment. Each service identifies the core capability – in direct labor hours – required to support the tasked weapons/equipment owned by that service. Each service uses the DoD core methodology to determine the core requirements for the contingency plan.

B. The Air Force Core Determination/Risk Assessment process utilizes a Repair Base Analysis (RBA) Report to aid in evaluating risk to the warfighter. The RBA report is an assessment of the commercial repair base for the individual commodities to include private sector capacity, equipment, skills, and production disruptions. The following categories are addressed during Risk Assessment: Readiness or Sustainability, Production Disruption, DOD Organic Capability, Commercial Infrastructure, Sole Source, Data Availability, Military Peculiarities, and Diminishing Technologies.

C. The contingency plan is updated as new threats/situations are evaluated and the tasked weapon systems required vary accordingly. Contingency plan changes that impact core are phasing out older weapon systems, adding new weapon systems, quantity of weapon systems designated, and flying hours of the tasked systems.

D. To determine the core capability for an existing commodity, direct labor hours needed to support the tasked requirements are identified based on repair histories. Secondly, the private sector capability is assessed to determine the risk to the Air Force mission if the work is done in the private sector. Based on predetermined criteria, the private sector assessment is rated as low, medium, or high risk. After the risk assessment is completed, a core recommendation is made. The core recommendation may retain all of the capability as core, retain part of the capability as core, or compete the entire capability. The mitigating circumstances include other DoD capability sources that can accommodate additional work or the capability in the private sector provide an acceptable risk to compete.

E. "The Source of Repair Assignment Process (SORAP) is the Air Force decision process used to determine the best value source of repair to support warfighting readiness while ensuring compliance with current legislation (10 USC 2464, Core capabilities, 10 USC 2466, and 50/50 threshold). The SORAP must be completed and approved for all depot level maintenance workloads (DLM) generated by new acquisitions or by modifications; whenever there are additional or significant changes to depot level requirements associated with any DLM workload; and whenever a DLM workload is considered for a workload shift (organic to contract or vice versa). All SORAP packages must undergo a "Core Analysis" during processing. This analysis is accomplished to determine if that particular workload is a candidate to support a core capability. The methodology for this analysis is as follows:"

New acquisitions are reviewed to determine the need for core requirements. Is the new item tasked or a component of a tasked system/equipment? How much does the new item surge? Does Air Force Material Command (AFMC) have the capability to repair the new item? Is the core capability for the commodity known? Does AFMC need the new item to retain the core capability? If the depot source failed what impact is there on the mission of the tasked system? Are there multiple repair sources in the private sector that can support the wartime requirements? Is the new item a single service or joint service acquisition? If the new item is a joint service acquisition, teach participating service reviews the item for core requirements. If the participating services reach different conclusions for core requirements, joint resolution is needed.

4. ARMY CORE DETERMINATION PROCESS AND RESULTS

A. As of the date of this report, the group had not received any information as to this section.

5. SIMILARITIES AND DIFFERENCES AMONG THE SERVICES

A. All the services apply the DoD methodology basically the same with the exception of Block F-2, Assessment of Capability. In that particular block, the type of workload needed to sustain core capabilities is up for interpretation.

(1) The Navy strongly believes that the sophistication of current-day weapon systems and the associated processes and support equipment demand specific workload for platforms identified in the JCS scenario/DPG (not all the workload, just an efficient level of workload). Note Navy's interpretation is well supported by both the new language (10USC2464 of 18 Nov 97) and the DoD Core Methodology (Block A-2).

(2) The Air Force uses a "commodity" perspective to define the type of workload needed to sustain their core capabilities. This tends to reduce the workload required for core.

(3) It is not clear how the Army interprets core capabilities, so we are therefore uncertain of the differences between them and the other services.

6. ISSUES AND CONCERNS

A. DoD's core methodology includes a critical element categorized as "F-2 – Assessment of Private Capability." The decision logic at this step is not very clear. The DoD instructions for this step state "If the capability associated with a specific maintenance hardware requirement is needed to support the Service Secretary's organic industrial base required for readiness and control, go to Block F-3 (Basic Core)." However, the decision flow

diagram includes the assessment of private capability as a decision point based upon the acceptability of the risk. Thus, the flow diagram does not support the instructions noted above.

B. According to the diagram, workload is identified as "basic core" if the assessment of private sector capability indicates that the risk to DoD of having a ready and controlled source is too great. If the logic of the decision diagram were implemented as illustrated, the DoD could work in conjunction with the private sector through an industrial base assessment to identify those capabilities of the industrial base that do pose a significant risk to DoD's current and future capability to support a ready and controlled force. DoD does conduct industrial base assessments, but these assessments are not in any way formally linked or integrated to the service's implementation of the core methodology. If these formal industrial base assessments were used consistently by all the services in their implementation of the core methodology, there would be a common framework based upon agreed upon risks to segments of the industrial base that support DoD.

7. SUMMARY AND FINDINGS

There are basic differences between the Air Force and the Navy in interpreting the DoD core direction. The Navy determines core by weapon system and the Air Force determines core by commodity.

SECTION VII

BARRIERS TO IMPLEMENTING COST EFFECTIVE AVIATION SUPPORT

1. LEGISLATIVE DIRECTIONS

A. Over a period of years the U.S. Congress has enacted a complex and interwoven series of legal requirements affecting the implementation of logistics policy and system support activity within the Department of Defense. The stated purpose of these provisions is to provide for a range of legitimate and necessary defense preparedness needs. Among these needs are fulfillment of the readiness requirements of the armed forces, retention of certain basic levels of maintenance capability within the government, meeting surge requirements in times of armed conflict, and provision of a mechanism for the allocation of depot-level workload between public and private sector providers. The practical impact of these legal provisions, however, has been to reduce DoD's ability to manage its system support resources in the most flexible, efficient and cost effective manner.

B. The sub-optimal use of defense funds and capabilities for the support of its legacy systems has become a particularly acute problem for the department in recent years. In the post-Cold War era, DoD has seen its investment accounts, including its research and development capability and its procurement resources, pared back significantly. Public desire for a peace dividend in the Cold War aftermath, pressures for overall budget reduction and reduction of long term national debt, and the increasing financial pressure of entitlement spending are at the root of this downward pressure on defense spending.

C. At the same time, DoD faces mounting force modernization needs as legacy programs are kept in the inventory far longer than their intended life span, and fewer new systems are being acquired. In the face of a defense budget top line, that until recently has steadily diminished and is not likely to rise significantly in the near future, DoD has sought to shift funds from its operations and support activities to its investment accounts in order to address its force modernization requirements. Many of these efforts are being frustrated, however, in large part by the restrictive legal framework for logistics support activity in which DoD operates.

D. The first section of this report provided a compendium of statutory provisions and enactments that impact the DoD policy environment for logistics support activity. The following discussion selects a number of these legal provisions that represent, in the view of the report's authors, particular impediments to the execution of support concepts, which expand the role of the private sector.

(1) For example, DoD is required by law in 10 USC 2464 to maintain a CORE logistics capability in order to perform maintenance and support of mission essential equipment. The law further directs that CORE work may not be contracted out to the private sector. CORE, however, is not precisely defined and is not implemented consistently across the services. Additionally, the original equipment manufacturer in private sector facilities supports, either in whole or in large part, a number of defense systems that are mission essential.

(a) While the department has called for the retention of a minimal CORE capability internally, the confusion on CORE definition and implementation, and the pressure from many in Congress to retain significant workload levels in public facilities has

resulted in robust levels of CORE capability retained in government. Clearer definition of the meaning of CORE in regard to the support of legacy systems, consistency in the application of this definition across the services and acceptance of a minimal CORE capability retained in house would afford DoD greater ability to manage its resources more flexibly and cost effectively. This in turn would open the path to greater ability to meet its force modernization needs.

(2) A second important statutory impediment is found at 10 USC 2466, which stipulates that not more than 50 percent of the funds available in a fiscal year to a military department or a defense agency for depot-level maintenance and repair workload may be used to contract for the performance of this workload by non-federal government personnel. This provision was recently changed from a 40 percent cap on the amount of depot workload that could be contracted out to the 50 percent level. At the same time, however, Congress altered the definition of contractor logistics support in a manner that apparently will result in little if any additional headroom for the department to contract out if it so desires.

(a) While this report does not argue for blanket contracting out of depot maintenance functions, for the retention of arbitrary levels of workload, in-house retention is also not justified. There is nothing in the legislative history of the original 60/40 law or the new 50/50 law that on a substantive basis supports such fixed levels for the allocation of depot workload between public and private providers. Rather the law appears to merely retain and justify the current public/private workload allocation. While there may be some value in the predictability of workload allocation, this approach clearly inhibits DoD's ability to shift assignments and resources in order to obtain the best value for each support dollar that it spends.

(3) A third key legislative impediment imposed on the department is found at 10 USC 2469, a law stipulating that existing depot-level maintenance or repair workload valued at $3 million or more that is identified for outsourcing must first be the subject of a public/private competition. Under this precept private firms compete against government depots for the opportunity to perform depot maintenance, modification and upgrade work. While there is broad ranging support for competitive sourcing on the part of all participants in the process, many have concerns with the public/private depot competition process because they are not viewed as true competitions.

(a) This is an area where there is a wide variation in perceptions between industry and the government. Many in industry have expounded the view that these competitions are not carried out on a level playing field and that the government does not account for its true costs when performing cost comparisons. Industry must, by law, account for all of its costs for work performed. In contrast, government accounting systems are structured to ensure accountability and trace the authority and source of funds by fiscal year and budget account. In the eyes of many in industry this disparity results in "apples to oranges" comparisons which undermine the validity of public-private competitions.

(b) The government, on the other hand, can cite DCAA certification and GAO reviews upholding the validity of government cost systems and the results of the competitions. The disagreement in perceptions has resulted in distrust and frustration in both the industry and government which is counterproductive to the objectives of providing required support at the least total cost. It is imperative that government and industry work together to close this gap. As an example, the Naval Air Systems Command and the Navy Inventory Control Point (NAVICP) have collaborated in preparation of the Maintenance Trade Cost Guidebook, which

included review by industry, to further define the appropriate cost elements and data sources for cost comparisons. The participation of industry has contributed substantially to the quality of the product and has also demonstrated the willingness to address issues of concern to industry.

(c) In addition to these long-standing provisions of law, several provisions enacted in the last congressional cycle give reason for concern. Section 342 of the FY99 National Defense Authorization Act imposes additional administrative burdens on the process when Congress seeks to attain best value through outsourcing opportunities. Section 343 creates a unique definition and requirement for commercial items as they pertain to depot maintenance activity, which does not necessarily support the current trend toward civil/military integration. Section 346 adds an additional procedural step into the departmental efforts to achieve savings and cycle time reductions using the prime vendor support model for total weapon system maintenance and modernization. Finally, Section 351 pertaining to C-17 maintenance seems to imply that CORE be redefined on a system rather than a capability basis. Implementation of CORE on a system basis would further restrict the department's management flexibility and would seriously skew the allocation of its logistics support resources.

(d) In recent years Congress has also enacted very positive, forward looking provisions that should be recognized, implemented aggressively and used to benefit the warfighter and the taxpayer as the defense logistics function is carried out. Among these are last year's support for public/private partnering and teaming in the execution of depot maintenance workload; the acquisition improvements embedded in the Federal Acquisition Streamlining Act; the Federal Acquisition Reform Act and the Federal Activities Inventory Act; and the recent Defense Appropriations Act language calling for fully certified accounting for all public and private direct and indirect costs. This applies to instances where the private sector is required to compete with the public sector in the allocation of depot workload.

(e) Counterbalancing these positive actions, however, are the numerous restrictive legal provisions remaining in effect that seriously hamper DoD's ability to manage most effectively. As the department and its supplier base continue to seek innovative, cost effective and productive ways to meet system support and force modernization needs within the current legal framework, the restrictive and inhibiting legislative provisions cited above over time needs to be recognized as a significant barrier by the working group.

2. CULTURAL

DoD has an opportunity to change the way in which it establishes and maintains business relationships with industry. The ability to face and accept this challenge is dependent upon the leadership and commitment of senior DoD and service officials. The operational commands recognize that they can no longer afford their required levels of readiness operating with "business as usual." The commands and organizations within DoD that support DoD's core warfighting mission, must undergo the revolution in business affairs that has received so much publicity in recent years. The necessary strategies and tactics essential to this revolution must be clearly defined and undertaken. The business practices that include contracting, finance, legal, auditing, engineering, material management, and maintenance, to mention a few, must change. Their new missions should be established and performance measured by how they can add value to DoD's new business challenges – working with the operators to better define what performance is required at what price – working with industry partners to re-define the

nature of business relationships – working closely with Congress and political leaders to grow their commitment and support of the required changes – demonstrating that by "letting go" of traditional support approaches, DoD will have greater control of its own destiny.

SECTION VIII

CONCLUSIONS AND RECOMMENDATIONS

In spite of continued emphasis of the benefits associated with employing commercial practices and sources of support to military aeronautical systems, significant barriers to the optimal employment of these resources continue to exist. A clear understanding of these barriers, and other impediments, is essential to attaining the full benefits of partnership between government and industry in improving our nation's warfighting capability.

The JALB focus on commercial support of military aviation alternatives is driven by the force modernization needs faced by each of the services at a time when resources for acquisition of new defense systems are increasingly constrained. These resource limitations are very real and are not likely to diminish greatly in the foreseeable future

Of even greater import for the nation's force modernization needs is the unevenness within the DoD budget with which these resource reductions have occurred. Whereas the overall DoD budget has declined by 28 percent since 1990, procurement spending has dropped by 53 percent, while operations and maintenance activity has declined by only 15 percent.

The procurement lull in new system acquisition, and the increasing reliance on aging platforms far past their original planned life cycle, is expanding the need for a concerted effort to upgrade and update our defense systems. This is a growing need as we prepare to enter the new century. Yet, the options for meeting this force modernization imperative, and for improving overall force readiness, are severely limited.

This trend, if continued unchecked, will diminish our defense program's ability to act as a true deterrent to international aggression, to meet the challenge of regional assignments to which our troops increasingly are deployed, and to effectively prevail in future armed conflicts. Faced with this daunting set of force modernization and resource challenges, civilian and military leaders in the defense community are looking for innovative approaches to logistics support. This would apply to legacy systems, as well as the limited number of new systems that we will acquire in the future, as a means to create savings. These savings will ultimately support force modernization and help ensure the necessary levels of readiness.

Innovative approaches to support of legacy systems, and the integration of logistics support concepts into the acquisition process for new weapons platforms, can be used to produce life cycle savings, reduce cycle times and improve performance. In essence, innovative logistics support can become an enabler for force modernization and aviation system readiness as we seek to prepare for the national security challenges of the 21st century.

It is this theme of innovative logistics support that guided the JALB working group as it assessed the applicability of commercial support strategies for defense aviation programs. The working group in evaluating these options did not view commercial support as a monolithic concept. Rather, commercial support for defense aviation systems fell into three broad categories. Each of the categories has potential applicability for the department at the right time, and in the appropriate circumstances. These categories are:

- Public organic depot and defense industry adaptation of best commercial aviation support practices in order to reduce support costs, improve cycles times and insert new technologies into legacy defense systems;

- Acceleration of the trend toward public/private cooperation, through teaming and partnering relationships, in the performance of logistics support for legacy systems as a means of infusing best practices from the two sectors into the logistics support function; and

- Outsourcing of aviation system support workload to the private sector, where such actions will help realize the department's goals of enhanced capabilities, reduced costs, and improved readiness rates.

In reviewing and assessing these aspects of commercial support of defense aviation programs, the working group came to the following key conclusions:

- The effective application of commercial aviation support practices to defense requirements requires a detailed understanding of the approach, structure and metrics of the commercial aviation environment which are significantly different than DoD's current approach.

- DoD's current implementation of its core policy and methodology is inconsistent and subject to frequent changes. This situation does not enable the development and implementation of support solutions that maximize performance and minimize the total cost of ownership.

- Significant legal, regulatory, and cultural barriers do exist to increased reliance on commercial aviation support of defense aviation programs.

- Significant opportunities exist to reduce cost, shorten cycle times, and improve operational performance through increased reliance on commercial support of defense aviation systems, while remaining well within the bounds of current policy constraints.

- The concepts and policy tools associated with the Performance Based Business Environment (PBBE) for defense logistics is the pathway for making near term progress in enhanced logistics capabilities and for helping to overcome policy barriers in the longer term.

- Performance Based Logistics (PBL) is the approach that will permit enhancement of the Performance Based Business Environment for logistics activities.

- Current defense department policies, structures, metrics, incentives and processes do not adequately promote implementation of Performance Based Logistics in a Performance Based Business Environment.

- Incentives must be in place for acquisition managers and managers of fielded systems in order to change designs and invest funds for potential future savings and modernization of their systems. While some progress has been made in implementing innovative support concepts within various programs, the current weapon system program environment does not facilitate nor incentivize such implementations.

- A process needs to be defined and accepted that will allow for evaluation and implementation of new ways of doing business. Emphasis needs to be placed on the concept of employee empowerment to embrace new contracting methods that make sense. Government personnel need to be empowered to utilize a commercial, best-value decision making process instead of a typical simplistic cost evaluation for which no accurate cost baseline exists.

Based upon these conclusions and the supporting analysis, the working group makes the following recommendations to the Joint Aviation Logistics Board in support of the appropriate reliance on commercial aviation support for defense aviation programs:

- The Department of Defense and the Military Departments should seek to adapt commercial aviation support practices for the support of defense aviation programs including a disciplined effort to shed non-core competencies and activities, elimination of non-value added overhead expenses, use of performance metrics that tie service delivery to departmental readiness goals, and development of long term relationships with qualified members of its industrial supplier base.

- The Department of Defense and the Military Departments should foster consistent policies across the services that ensure the use of Performance Based Logistics practices within a Performance Based Business Environment. Encompassed by this PBL approach are logistics practices including flexible sustainment, prime vendor support relationships, direct vendor delivery relationships for entire weapons systems as well as for consumables and reparables, and virtual prime vendor relationships. These initiatives are in the early stages of development and deployment. There is much to be done to educate both Government and industry personnel in the benefits of performance-based logistics and how to implement these new concepts of support that will achieve “better-faster-cheaper results/resolutions.”

- The Department of Defense and the Military Departments should actively encourage the development of public/private cooperation through teaming and partnering relationships, for the delivery of defense aviation system support as a best practice in the logistics arena.

- The Department of Defense and the Military Departments should adopt a policy of full cost accounting for organic support activities, including the accounting for all direct and indirect costs for organic aviation support activities.

- The Department of Defense and the Military Departments should ensure the use of common defense support terminology through the official adoption and broad dissemination of the Glossary of Terms appearing in Appendix (B) of this report.

- The Defense Acquisition University, the Defense Systems Management College, and the other defense schools that teach acquisition policy should feature Performance Based Logistics in a Performance Based Business Environment, and the related innovative commercial best practices for logistics support as elements of their core curricula.

- The Department of Defense and the Military Departments in the near term should seek to overcome the cultural and regulatory barriers to appropriate reliance on commercial

aviation support for defense aviation systems. In the long term, as circumstances permit, the Department seeks to overcome the legal barriers to wider use of commercial aviation support practices and capabilities.

- The Department of Defense and the Military Departments should direct their System Commands (SYSCOMS) and maintenance depots to collect data and document on all occasions, where legislative or policy constraints have a significant affect on cost and/or readiness.

The use of award term contracts, although limited to date, can facilitate the Department of Defense's transition to performance-based logistics. Award term contracts are based on the premise that the incentive of extending the period of work will provide sufficient motivation for continuous improvement and thus, performance that exceeds expectations. In this era of declining defense budgets and shrinking defense markets, this motivation should work very well. In addition, a concept similar to award term contracts could also be applied to internal DoD providers of logistics support. A specific memorandum of agreement between the DoD end user and the DoD provider of the logistics support could agree to specific workload at set sales prices for a specific period of time that would be extended or shortened based upon meeting or exceeding set levels of performance. In a similar fashion, the warfighters could negotiate their performance levels with the DoD providers of the support and expand or shorten the period of work based on the performance of the internal (organic) provider of the service or product.

The Department of Defense should transform the way in which it conducts logistics business. The goals and objectives of logistics support activities should be performance-based regardless of the source of the support (i.e. either private sector or organic provider). In order to incorporate the tenets of performance-based logistics support in the Department's business arrangements, the use of award term contracts for the private sector logistics support and the use of a similar mechanism, such as an internal award term memorandums of agreement between the DoD recipients and DoD providers of logistics should be the standard way of conducting business.

The members of the working group are confident that if these recommendations are implemented consistently across the Department of Defense, it can make significant progress toward achieving both its readiness and its capability improvement goals. In the process, logistics support truly can be an enabler for force modernization.

APPENDIX A

AVIATION LOGISTICS BOARD
CHARTER FOR THE COMMERCIAL SUPPORT OF AVIATION SYSTEMS SUBGROUP

ISSUE:

In spite of continued emphasis of the benefits of using commercial practices and sources for the support of military aeronautical systems, significant impediments to widespread adoption of this resource continue to exist. Among these impediments are:

- Degree of understanding of the expectations of contractor versus organic support,
- Definitions of support and business practices,
- Demarcations of inherently governmental functions,
- Understanding of commercial off-the shelf/non-developmental item application to satisfying military requirements,
- Determining "full cost to the taxpayer" for the current organic approach,
- Assessing the total costs associated with alternative solutions to the support of aviation systems,
- Evolving understanding within the defense community of commercial support concepts and implications, and
- The cultural, regulatory and legal barriers to the full implementation of the "right" policy.

A clear understanding and resolution of these and other impediments are essential to attaining the full benefits of the partnership of government and industry in improving our nation's warfighting capability.

APPROACH:

This charter establishes commercial support of aviation systems subgroup. This subgroup will:

- Define key terms and initiatives relative to innovative logistics practices,
- Review existing policies and directives relative to commercial support of military systems,
- Review the Performance-Based Business Environment (PBBE) processes for completeness in addressing commercial support and business practices,
- Review lessons learned from existing commercial support programs,
- Propose methodology for determining "full cost to the taxpayer" (regardless of color of money) for the current organic approach,
- Identify barriers to the full implementation of current policies,
- Recommend approaches to overcome known barriers,
- Develop implementation guidance for approved recommendations.

MEMBERSHIP:

The subgroup will consist of representatives nominated by ALB members. Representation from AIA will have full membership on the subgroup. The subgroup may use the services of advisors and consultants. These will not be full members of the subgroup.

STRUCTURE:

The subgroup is responsible for conducting the commercial support study and documenting the results. Where necessary, the subgroup will charter working groups to address specific issues. The working groups will report directly to the subgroup.

REPORTING REQUIREMENTS:

The subgroup will report to the ALB during scheduled ALB meetings. At a minimum, the report will provide the status of the study, working group progress, and requests for approval of subgroup findings.

PRODUCTS:

The subgroup will document the results of the study and recommendations in the appropriate form, i.e. draft instruction or directive, desktop guide, manual, etc.

DURATION:

The commercial support subgroup will remain in place until January 2000.

APPROVED BY:

_____
Robert e. Mulcahy, SES
ALB Chairperson

//signed 3 February 1998//

APPENDIX B

GLOSSARY

PERFORMANCE-BASED LOGISTICS (PBL)

Acquisition Logistics – The logistics policies and processes used to influence systems design and acquisition so that a system can be supported in the field at the lowest life cycle cost. Acquisition logistics activities generally occur from the formation of the program office through the system's required asset availability date. (See Design Interface and Systems Engineering.)

Activity-based Costing (ABC) – A cost accounting system that accumulates costs based on activities performed and then uses cost drivers to allocate these costs to products or other bases, such as customers, markets, or projects. It is an attempt to allocate overhead costs on a more realistic basis than direct labor or machine hours. (11)

Activity-based Management (ABM) – The use of activity-based costing information about cost pools and drivers, activity analysis, and business processes to identify business strategies; improve product design, manufacturing, and distribution; and remove waste from operations. (11)

Affordable Readiness – A NAVAIR initiative for implementing performance-based logistics incorporating four separate yet related elements; (1) flexible sustainment, (2) total cost, (3) sustained maintenance planning, and (4) rightsourcing.

Agile Logistics – Maximize operational capability by using high velocity, time definite processes to manage mission and logistics uncertainty in-lieu of large inventory levels – resulting in shorter cycle times, reduced inventories and cost, and a smaller mobility footprint. (Replaces Lean Logistics.) (8)

Availability – A measure of the degree to which an item is in the operable and commitable state at the start of a mission when the mission is called for at an unknown (random) time.

Award Term Contract - A type of incentive where the contractor (private or public) is incentivized by being awarded an additional period (e.g., year) onto a contract due to meeting or exceeding the performance requirements of the contract during the current period.

Best Commercial Practices – Those techniques, methods, customs, processes, rules, guides and standards that maximize the long term profits of a commercial enterprise while exceeding its customers' expectations.(1) (See Commercial Practices.)

Best Government (DoD) Practices – Those techniques, methods, customs, processes, rules, guides and standards (including appropriate commercial practices) that provide the warfighter with the necessary capability to protect the Nation's interests at the lowest long term cost to the taxpayer. (1)

Best Value (BV) – A process used in competitive negotiated contracting to select the most advantageous offer by evaluating and comparing factors in addition to cost or price.

Business Case Analysis (BCA) – A review / assessment of business-related issues regarding a specific action or recommended change; what needs to happen, why it must happen, how it will occur, what it will take (time, resources, management, and cost) and the timing and quantification of savings and other tangible results.

Capability – The combination of skills, facilities and equipment, processes, and technology needed to perform a particular category of work (e.g., composite repair).

Centers of Technical Excellence – DoD activities that have specialized capabilities for specific types of workload (e.g., missiles, aircraft engines, etc.).

Commercial Activity – An activity that provides products or services obtainable from the private sector. Examples of commercial activities include custodial services, grounds maintenance, base supply, vehicle operations and maintenance, etc. A commercial activity may be performed by military and/or Federal civilian employees, or contract personnel. Agency missions may be accomplished through commercial facilities and resources, Government facilities and resources or mixes thereof, depending upon the product, service, type of mission and the equipment requirement.

Commercial Operations and Support Savings Initiative (COSSI) – A joint program of the Army, Navy, and Air Force. The program's objective is to employ a new method for reducing DoD Operation & Support (O&S) costs by inserting commercial items into fielded military systems. COSSI's mission to develop and test the method.

Commercial Practices – Those techniques, methods, customs, processes, rules, guides and standards used by profit-based organizations to achieve their business objectives. Generally, the profit motive encourages improvement in efficiency and effectiveness of the enterprise. (1) (See Best Commercial Practices.)

Commercialization – Utilization of government-owned facilities/equipment to accomplish government and/or non-government work.

Components – Assemblies or subassemblies for which depot maintenance is provided (e.g., avionics/electronics, black boxes, hydraulic pumps, landing gear, etc.). Some items such as gas turbine engines or landing gear may be categorized as both end items and components. (See End Item.)

Contracting Maintenance Services – A support concept where a contract provides maintenance for a system but is not necessarily responsible for the support elements necessary to execute the maintenance.

Contracting Out – (See outsourcing.)

Contractor-owned, Contractor-operated (COCO) – Facilities and equipment that are owned and operated by a commercial contractor.

Contractor Logistics Support (CLS) – A pre-planned method of support where a contractor provides all maintenance, supply, and associated logistics support elements for a system, subsystem, modification or equipment throughout its entire life cycle. CLS provides logistics support for all or part of the system, subsystem or equipment to meet mission requirements.

Contractor Support (CS) – A broad term used for planned contractor support concepts that provide all or part of the support elements for a system, subsystem, equipment, or an end-item, for an interim period or for life. Contractor Support has as a subset the following methods of CS: Pre-operational Support (POS), Interim Contractor Support (ICS), Contractor Logistics Support (CLS), Contract Depot Purchased Equipment Maintenance (DPEM), and Total Contract Training (TCT).

CORE – The capability maintained within organic Defense Depots to meet readiness and sustainability requirements of the weapons systems that support JCS scenario(s). Core exists to minimize operational risks and to guarantee required readiness for these weapons systems. Core depot maintenance capabilities will comprise only the minimum facilities; equipment and skilled personnel necessary to ensure a ready and controlled source of required technical competence. Depot maintenance for the designated weapon systems will be primary workloads assigned to DoD Depots to support Core depot maintenance capabilities.

CORE Logistics Capabilities – Government-owned and Government operated equipment and facilities to ensure a ready and controlled source of technical competence and resources necessary to ensure effective and timely response to a mobilization, national defense contingency and other emergency requirements. The Secretary of Defense shall identify the core logistics capabilities required to maintain those capabilities. The core logistics capabilities shall also include those capabilities that are necessary to maintain and repair the weapon systems or materiel not later than four years after achieving initial operational capability, but excluding system and equipment under special access programs, nuclear aircraft carriers, and commercial items.

CORE Maintenance – An integral part of a depot maintenance skill and resource base that shall be maintained within depot activities to meet contingency requirements. Core will comprise only a minimum level of mission essential capability and must be under the control of an assigned individual DoD component or may be a consolidated capability under the control of an assigned or jointly determined DoD component where economic and strategic considerations warrant.

Corrective Maintenance – All actions performed as a result of failure in order to restore an item to a specified condition. It represents the whole of the activities accomplished after the system failure or after the degradation of its function in order to allow the system to carry out the required function, at least temporarily. Corrective action maintenance can include any or all of the following: localization, isolation, disassembly, interchange, re-assembly, alignment, and testing for normal function. Syn: Unscheduled Maintenance. (See Preventive Maintenance.)

Corporate Contracting – The establishment of a single DLA-wide contract by a lead supply center with a major supplier for use by all centers. Utilizes long-term contracting, options, DVD and EC for multiple product lines consolidating DLA business into a single contractual vehicle. Generally used for sole source items. (6)

Cost as an Independent Variable (CAIV) – A strategy that entails setting aggressive, yet realistic cost objectives when defining operational requirements and acquiring defense systems and managing achievement of these objectives. Cost objectives must balance mission needs with projected out-year resources, taking into account existing technology, maturation of new technologies and anticipated process improvements in both DoD and industry. As system performance and cost objectives are decided (on the basis of cost-performance trade-offs), the requirements and acquisition processes will make cost more of a constraint, and less of a variable, while nonetheless obtaining the needed military capability of the system. Although much discussion of CAIV is centered on new systems, there is always opportunity for cost reduction. CAIV principles are applicable throughout a system's life cycle. (14)

Cost-per-Flying (or Operating)-Hour (CPFH) – The cost of owning and operating an aircraft, system, or component expressed as the cost incurred in a period (week, month, year, etc.) divided by the number of hours the item was operated (in service) in the same period. (See Power-by-the-Hour.)

Customer-supplier Partnership – A long-term relationship between a buyer and a supplier characterized by teamwork and mutual confidence. The supplier is considered an extension of the buyer’s organization. The partnership is based on several commitments. The buyer provides

long-term contracts and uses fewer suppliers. The supplier implements quality assurance processes so that incoming inspection can be minimized. The supplier also helps the buyer reduce costs and improve product and process designs. (11)

Depot Maintenance and Repair – Equipment maintenance that requires major overhaul or extensive rebuilding of parts, assemblies, subassemblies, and end items (e.g., aircraft, engines, ships, etc.), including the manufacture of parts, modifications, testing and reclamation as necessary regardless of the source of funds for the maintenance or repair. Depot maintenance can include a wide spectrum of functions such as direct (touch) labor, production planning, material support, and some aspects of in-service engineering. Depot maintenance effort is accounted for under appropriate work performance categories. These include overhaul, progressive maintenance, renovation, analytical rework, repair, inspection and test, software support, conversion, modification, activation, inactivation, manufacture, reclamation, storage, technical assistance and other. Depot level maintenance includes more extensive facilities for repair than are available at lower maintenance activities. Depot activities support lower levels of maintenance by providing technical assistance and performing that maintenance beyond their capability / responsibility. Depot maintenance is a capability, not a location. The term includes (1) all aspects of software maintenance classified by the DoD as of July 1, 1995 as depot-level maintenance and repair and (2) interim contractor support or contractor logistics support (or any similar contractor logistics support), to the extent that such support is for the performance of services as described above.

Design Interface – The acquisition logistics interface with the design process is through the systems engineering process. Supportability must be considered as part of the requirements generation and analytical activities and continue though design, test and evaluation, production, and fielding. The early focus should result in the establishment of support related design parameters. These parameters should be expressed both quantitatively and qualitatively in operational terms and specifically relate to readiness objectives and the support costs of the system. (3)

Direct Vendor Delivery (DVD) – (1) Planned DVD is a concept developed by DLA that has a contractor be the point of issue for stock direct to the user. The contractor is responsible for holding inventory and delivering items directly to the user within a specified rapid response time period after the receipt of a delivery order via EDI. The required delivery cycle-time for planned DVD is characteristically much shorter than the normal acquisition lead-time for the product. (2) Unplanned DVD is where the item is not stocked due to economic order quantity reasons and is generally delivered after the full acquisition lead-time. (6)

Direct Vendor Delivery-Reparables (DVD-R) or DVD-Plus (DVD+) – An initiative by the U.S. Navy to expand the DLA DVD concept to include reparables. DVD-R assigns the contractor responsibility for inventory management, maintaining configuration control, making repair/overhaul/ replacement decisions, providing direct delivery within specified time periods, warranting product (MTBF guarantee), and inserting new technology. It is based upon establishing performance requirements and incentives for the contractor. (See Performance-based Logistics.)

Divest – To dispose of government property (e.g., industrial facilities, equipment and material).

Dual-use Facilities – Facilities that are jointly used by a government activity and any non-federal user (e.g., private industry, education institutions, and state/local governments).

End Item – Nominally a weapon system such as an aircraft, ship tank, etc., but sometimes interpreted as an item that includes many subassemblies (e.g., landing gear). A gas turbine engine could be either an end item or a component of an end item (e.g., an aircraft). (See Component.)

Enterprise Linked Logistics (ELL) - (See Support Chain Management.)

Enterprise Resources Planning (ERP) System – An accounting-oriented information system for identifying and planning the enterprise-wide resources needed to take, make, ship, and account for customer orders. An ERP system differs from the typical MRPII system in technical requirements such as graphical user interface, relational database, use of fourth-generation language, and computer-aided software engineering tools in development, client/server architecture, and open system portability. (11) (See Supply-chain Management.)

Failure Rate – Applies to (and is a property of) a population to which a distribution has been assigned, not to an individual in that population. For example, it is possible for all individual items to be literally wearing out and yet for the population to have a constant or even decreasing failure rate. (15)

Focused Logistics (FL) – The fusion of information, logistics, and transportation to provide rapid crisis response, to track and shift assets even while enroute, and deliver tailored logistics packages and sustainment directly at the strategic, operational, and tactical level of operations worldwide. It includes concepts such as accuracy, real-time information, "Industry to Foxhole," and Multinational Logistics. Focused Logistics is fully adaptive to the needs of increasingly dispersed and mobile forces, providing support in hours or days versus weeks. It will enable joint forces of the future to be more mobile, versatile, projectable, and sustainable from anywhere in the world. It envisions a logistics system that is more responsive, flexible, and precise; and an environment where the military services and defense agencies work with the civilian sector to take advantage of advanced business practices, commercial economies, and global networks. (5)

Flexible Sustainment (FS) – A decision point driven process to implement acquisition reform in an orderly manner and optimize investment strategies for support. FS introduces new sub-processes, RBL and TBAM. In addition, other innovative support solutions, such as procurement of Form-Fit-Function-Interface (F3I) spares, performance warranties, and obsolescence assessment are presented as cost-effective life cycle cost support alternatives. (3)

Form-Fit-Function-Interface (F3I) – A mechanism to link design, fabrication, and support capability. This capability can reside in the same organization, either government or contractor. Key product performance characteristics and product acceptance criteria are specified; but there is flexibility to change the design while meeting performance requirements, as well as flexibility to change the manufacturing processes to produce the design. The end item performance must be verified to be unaffected by the design and/or process change. These changes must consider total life cycle cost impacts as part of the overall decision process. Again, prior customer approval of changes may or may not be required depending on the demonstrated capability of the supplier. Technology insertion without the need for equipment modification can often be accomplished with commercial substitutes such as commercial items, modified commercial items, or non-developmental items. (3)

Government-owned, Contractor-operated (GOCO) – Facilities and equipment that are owned by the federal government and operated by a commercial activity under a government contract.

Inherently Governmental Function – "… means, as a matter of policy, a function that is so intimately related to the public interest as to mandate performance by Government employees…. Governmental functions normally fall into two categories: the act of governing, i.e., the discretionary exercise of Government authority, and monetary transactions and entitlements."(13) For example, command & control, intelligence operations, foreign relations, directing Federal employees, and accountable officers with discretionary authority to disburse funds are inherently

governmental functions. These type functions are not in competition with the private sector.

Joint Total Asset Visibility – The capability to provide users with timely and accurate information on the location, movement, status, and identity of units, personnel, equipment, and supplies. It also includes the capability to act upon that information to improve overall performance of DoD's logistics practices. (5)

Just-In-Time (JIT) – An approach to manufacturing and distribution that stresses the benefits of reducing/eliminating queue/travel time, excess inventory, and/or other non-value added activities in processes such that material is brought to the next operation or point-of-use precisely when it is needed.

Last Source of Repair – An organic depot that has become the only available source of repair for an item or system. This can result from a variety of economic and/or technical factors.

Lean Logistics – A USAF initiative for a JIT approach to weapon system support that converts Air Force logistics from a "push" to a "pull" support system. The focus is on rapidly repairing and flowing repaired parts through the pipeline in direct response to demands, thus putting the parts where and when they are needed. To accomplish this, inventories are partially centralized while maintaining slightly lower levels at bases, express transportation is employed to achieve response and speed, and dramatic process improvement is implemented. (Not to be confused with two level maintenance.) (See Velocity Management and Agile Logistics.)(8)

Lean Production – A philosophy of production that emphasizes the minimization of the amount of all the resources (including time) used in the various activities of the enterprise. It involves identifying and eliminating non-value-adding activities in design, production, supply-chain management, and dealing with the customers. Lean producers employ teams of multi-skilled workers at all levels of the organization and use highly flexible, increasingly automated machines to produce volumes of products in potentially enormous variety. Syn: Lean Manufacturing. (11)

Life-Cycle Cost (LCC) – DoD 5000.2-R has established increased emphasis on life cycle cost. The majority of a system's life-cycle costs can be attributed directly to operations and support costs once the system is fielded. Because these costs are largely determined early in the system development period, it is vitally important that system developers evaluate the potential operational and support cost of alternative designs and factor these into early design decisions. Some of the life cycle cost objectives are to design for system reliability, reduce operational and support costs, and plan for sustainment and modernization.

Life-Cycle Costing (LCC) – An acquisition or procurement technique that considers operating, maintenance, and other costs of ownership as well as the acquisition price, in the award of contracts for hardware and related support. The objective of this technique is to make sure that the hardware procured will result in the lowest overall ownership cost to the Government during the life of the hardware.

Life-Cycle Logistics (LCL) – LCL is a means of using supportability and affordability tradeoffs during the systems engineering process which can optimize acquisition of logistics and operations and support (O&S) costs while providing the best support package for our operational forces. In addition to cost, other factors may affect the trade-off process, such as changing mission requirements, new technology, and component obsolescence. Assessment of cost-effective life cycle support tradeoffs should be accomplished throughout the life of the system. (3)

Life-Cycle Program Management – The total life-cycle management of a given system, from concept through development, sustainment, in the operational phase, and final disposal. Program managers are directed by DoD 5000.2-R to develop and document an acquisition strategy to serve

as a roadmap for program execution from program initiation through post-production support and disposal. Life cycle cost program objectives must address this total life cycle systems engineering management concept.

Limited / Above Core – That portion of depot maintenance workload that must be conducted within DoD or the individual services because it is impractical for private industry to perform the work due to the small/limited quantities.

Locally Owned, Contractor-Operated (LOCO) – Facilities and equipment that were previously owned and operated by the federal government, but ownership has been transferred to a local reutilization authority for operation by a commercial contractor.

Logistics – The science of planning and carrying out the movement and maintenance of forces. In its most comprehensive sense, the aspects of military operations which deal with design and development, acquisition, storage, movement, distribution, maintenance, evacuation, and hospitalization of personnel; acquisition of construction, maintenance, operation, and disposition of facilities; and acquisition or furnishing of services. (JCS Pub 1-02)

Logistics Chain Management - (See Support Chain Management.)

Logistics Civil Augmentation Program (LOGCAP) – An initiative by the U.S. Army to pre-plan during peacetime for the use of civilian contractors to perform selected services in wartime and other contingencies to augment U.S. forces in support of DoD missions.

Logistics Reliability – The probability that no corrective maintenance or unscheduled supply demand will occur following the completion of a specified mission profile. Logistics reliability recognizes the effects of occurrences that place a demand on the logistics support structure without regard to effect on function or mission.

Maintainability – The probability that an item will conform to specified conditions within a given period when corrective or preventive action is performed in accordance with prescribed procedures and resources.

Maintenance Planning (MP) – Maintenance planning identifies maintenance tasks to be accomplished and time phasing for all levels of maintenance, including both preventive and unscheduled maintenance. It includes planning for various scenarios and environments throughout the life cycle of the weapon system. It establishes the maintenance and repair (organic and commercial) concepts, which define logistics requirements to the operational and supporting commands. (3) (See Sustained Maintenance Planning.)

Material Support Management (MSM) – A policy issued by the Marine Corps to pare down its logistics infrastructure of intermediate- and consumer-level supplies. Supplies of intermediate- and consumer-level items will not be kept unless they have a direct bearing on the service's readiness.

Mission-essential Materiel – Those weapon systems, equipment, and components designated by the Military Services as necessary for support of JCS approved scenario(s). PL99-145 defines mission essential material as "all material which is authorized and available to combat, combat support, combat service support, and combat readiness training forces to accomplish their assigned mission." This involves items that are required to support approved emergency or war plans, and that are used to destroy the enemy or its capacity to continue war; provide battlefield protection of personnel; communicate under war conditions; detect, locate, or maintain surveillance over the enemy; provide combat transportation and support of men and materiel; and support training functions.

Mission-essential Maintenance – Maintenance of items designated by the military branches for combat, combat support, combat service support, and combat readiness training forces and activities including Reserve and National Guard activities.

Mission Reliability – The probability that a system will perform mission-essential functions for a period of time under the conditions stated in the mission profile. Measures of mission reliability include only those incidents affecting mission accomplishment.

Organic – Internal DoD depot maintenance facilities and workload.

Out-of-Production (OOP) – A system or component that is no longer manufactured; (or), a system or component that is still manufactured, but is unique to a higher level system or component that is no longer manufactured (i.e., no longer manufactured in production quantities). (1)

Outsourcing – Involves transferring (or contracting out) activities that traditionally are being or have been performed in-house at in-house facilities to an outside activity provider; in the case of the Federal Government, from federal employees at federal facilities to private contractor employees at federal or private facilities. (12) (See Rightsourcing.)

Partnering – One that is united or associated with another or others in an activity or a sphere of common interest such as member of a business partnership. Characteristics of a business partnership are the sharing of planning functions, assets, risks, and profits. (See Customer-supplier Partnership.)

Performance-Based Business Environment (PBBE) – A "state of being" where government/contractor relationships capitalize on commercial practice efficiencies to improve the military acquisition and sustainment environment. In this new environment, solicitations and contracts describe system performance requirements in a way that permits contractors greater latitude than under historical acquisition methods to use their own design and manufacturing ingenuity to meet needs. Additionally, suppliers compete and are selected based upon their proposed approaches, process effectiveness, and prior performance. This environment, emphasizing risk management as opposed to risk avoidance, applies for new acquisitions, modifications to existing contracts, and/or sustainment activities. The objectives of PBBE are to:

Increase access to commercial, state-of-the-art technology and facilitate our suppliers adopting business processes with world class characteristics.

Integrate commercial and military development and manufacturing facilities, and adopt dual-use processes and products to help form a broadened industrial base capable of meeting defense needs at lower cost.

Encourage risk-based management practices leading to superior quality products at affordable cost.

Generally control only top-level product performance requirements. Government control below the top level will be implemented only when the sustainment plan for the product, a technology insertion strategy, or a program risk management strategy justifies the added government involvement.

Foster greater contractor involvement with sustainment issues. This includes reprocurement options ranging from contracting for Form-Fit-Function-Interface (F3I) replacements to more traditional Build-To-Print (BTP) purchases, based on economic benefits and the overall weapon system support concept. (2)

Performance-based Contracts (PBC) – A performance-based approach leverages the innovation of the commercial marketplace. "Tried and true" approaches used in the last contract may be woefully out of date. Allow commercial business to propose the same innovative methods and approaches used in the commercial sector.

Stating requirements -NOT SOLUTIONS- encourages proposals from many contractors. Increased competition results in more affordable services.

Faster-Better-Cheaper is the watchword of affordability. Performance-Based contracts support this objective.

A stated goal of Performance-Based contracts is to pay according to the degree the requirements are met.

Identifying actual requirements rather than telling industry how to meet them allows for metrics. Metrics allows us to measure achievement of the requirements.

Performance-based Logistics (PBL) – A concept that proposes that all logistics support elements can be incorporated within the PBBE. PBL includes flexible sustainment, but also incorporates DVD, technology insertion, RCM, process improvement, business re-engineering, and public/private partnering and teaming. PBL can be applied to fielded/legacy systems as well as new acquisitions. The basis of PBL is establishing logistics performance requirements and contractual incentives to mitigate obsolescence and lower the cost of ownership. (1)

Performance-based Spares Procurement – (See Spares Modernization.)

Power-by-the-Hour TM (PBH or PBTH) – A support concept developed by Rolls Royce whereby an owner/operator of an item (e.g., aircraft, system, or component) pays a price per operating hour for support to a logistics provider. The provider assumes the risk for the cost of providing support for the item. The price is a function of the scope of logistics provided (number of aircraft, operating hours, repair, overhaul, inventory, locations, transportation, etc.) and the performance guarantees offered (e.g., availability, turnaround time, removal rates, MTBF, etc.). Syn: Price per Flying (or Operating) Hour. (See Cost-per-Flying-Hour.)

Precision Logistics – A precise and seamless union of expeditionary operating force structure using better business practices to reduce cost, increase efficiency and provide exactly what the warfighter needs – when and where it is needed. A change in the paradigm from large inventories and organizations, to precision–information and speed. (5)

Preventative (or Preventive) Maintenance – The maintenance identified as being required as a result of RCM analysis is performed on a scheduled periodic basis to prevent failures. This type of maintenance is referred to as Preventative Maintenance. Preventative maintenance tasks are divided into two categories: scheduled inspections and scheduled removals or time change. Details regarding establishing and maintaining a Preventative Maintenance program contained in SAEJ2389 Scheduled Maintenance Standard. Syn: Scheduled Maintenance. (See Corrective Maintenance.)

Price-per-Flying (or Operating) Hour (PPFH) – Syn: Power-by-the-Hour. (See Power-by-the-Hour and Cost-per-Flying-Hour.)

Prime Vendor (PV) – Under the DLA PV arrangement, a contractor is responsible for supplying all requirements for a certain, end item, major assembly, customer or geographic region. The PV is responsible for acquiring, manufacturing or otherwise providing all the items covered by

the PV agreement. PV arrangements usually require planned DVD.(6) (See Prime Vendor Support and Virtual Prime Vendor.)

Prime Vendor Support (PVS) – This initiative allows a prime contractor of a weapon system to assume complete responsibility for its overall field performance. Complete responsibility for wholesale support is transferred to a single accountable corporate entity. The normal maintenance function is augmented with modification and upgrade through technology insertion over the life cycle of a system. This concept promotes significant in efficiencies as a single provider integrates support and enhancement. This approach will free up resources over time through elimination of excess capacity, both private and public. (See Prime Vendor and Virtual Prime Vendor.)

Private Sector – Not part of federal, state, or local government infrastructures, e.g., commercial firms.

Privatization – A subset of outsourcing that applies solely to the public sector and also typically involves transferring the control or ownership of assets (land, facilities, and/or equipment) from the public sector to private entities, or through providing vouchers. A subset of privatization is privatization-in-place (PIP) where an entire workforce, workload, and facility are transferred "as is" to a private sector contractor. Without assessing the workload before privatizing-in-place, however, costly inefficiencies can be perpetuated. (12)

Public Sector – Part of the federal, state, or local government infrastructure.

Readiness – Refers to the attributes and status of a weapon system's availability and capability to begin military operations. (See Sustainability)

Reliability – The probability that a system or component will perform its intended functions for a specified period under stated conditions. Reliability can be further broken down into mission reliability and logistics reliability. (10)

Reliability-Based Logistics (RBL) – A process that emphasizes the importance of designing reliability into systems to reduce the fielded maintenance support infrastructure. Specifically, RBL addresses whether an item should be treated as a consumable or a reparable; commercial vs. organic repair decisions; and the method of support as a function of cost effectiveness, considering the item's reliability, its technology cycle, and the useful life of the item. (3)

Reliability-Centered Maintenance (RCM) – RCM is a formal methodology used to develop a scheduled maintenance program that can increase the availability of the product by realizing the inherent reliability level. The process considers all maintenance significant components, which comprise the product or system. FMECA information is used to identify components that are critical to reliability and the product and where a failure would have the greatest effect on availability. The RCM process centers on the use of a logic tree that walks an analyst through a step-by-step process consisting of sixteen yes-no questions regarding each significant item. Based upon this analysis the analyst determines which maintenance task, if any is required. Details regarding RCM can be found in SAE Task Standard JXXX.

Retrograde – A non-serviceable item returned or being returned from the field. An item may be non-serviceable due to failure, breakage, wear, recall for mandatory or optional modification/ upgrade, warranty claim, etc. (sometimes referred to as a core, carcass, or reparable).

Rightsourcing – Selecting the most advantageous source to accomplish a specific function for a weapon system in its life cycle. Selection criteria include, but are not limited to life cycle cost, quality, reliability, safety, and effect on other programs. Specific functions may include any or all facets of design, engineering, manufacturing, in-service support, operation, and disposal of a

system. Outsourcing is one alternative under rightsourcing.

Single Process Initiative (SPI) - SPI is an initiative by DoD designed to: 1) eliminate multiple processes, both business and manufacturing/management, including direct and indirect cost drivers (e.g., material management systems, Cost/Schedule Control System Criteria (C/SCSC), price and cost analyses procedures, excess property procedures); 2) move to advanced world class practices, while reducing the need for oversight; and 3) achieve cost, schedule, and performance benefits for the government and the contractor. The Single Process Initiative is used in addition to existing contracting tools such as Value Engineering Change Proposals (VECPs), normal contract changes, etc., not in place of them. The goal is to use the "block change" modification approach to lead to the use of common processes and performance specifications on existing DoD contracts.

Spares Modernization – Improving system reliability at subsystem level. Redesign of secondary items to improve Reliability and Maintainability, promote technology insertion, and reduce life-cycle costs. Service programs include:

Army	Modernization through Spares (MTS)
Air Force	Improved Item Replacement Program (IIRP)
Navy	Logistics Engineering Change Proposal (LECP)

Supply-chain Management – The use of information technology to endow automated intelligence to an ever-growing network of delivery vehicles, distribution centers, factories, and raw material suppliers. The aim is for each participant in the supply chain to conduct business with the latest and best information from everyone else in the chain, guiding supply and demand into a more perfect balance. The purpose is to move product from the point-of-origin to that of consumption in the least amount of time at the smallest cost. Supply-chain management allows managers to do such things as integrate retail channels with manufacturing, drive demand for the point-of-sale, or eliminate inventory buffers in the distribution chain. Several management disciplines contribute to supply-chain optimization efforts, including forecasting, distribution management, production planning, transportation planning, and information systems technology. (4) (See Support-chain Management.)

Support – A generic term used to refer to the logistics activities for a system occurring after the acquisition phases are complete. Planning for the support function should begin at the program's inception and ends when it leaves the inventory.

Supportability – The degree to which system design characteristics and planned logistics resources, including manpower, meet the system peacetime readiness and wartime utilization requirements. Supportability evaluations include consideration of the impact of support decisions on operational performance, sustainability, and life cycle cost.

Supportable System – A system that has the inherent design characteristics that enable it to be supported in the field, if the necessary support resources (spares, technical data, training, manpower, etc.) are acquired.

Supported System – A system that has the inherent design characteristics and the military service has acquired the necessary support resources (spares, technical data, training, manpower, etc.) for field use.

Support-chain Management – A concept that encompasses supply-chain management and the integration and optimization of processes that support fielded product such as service and engineering support, warranty administration, spare parts, repair and overhaul, training, technical data, tracking and movement of retrograde, product performance data, and supporting information

systems technologies. (1) (See Supply-chain Management.)

Surge – The act of expanding an existing depot maintenance repair capability to meet increased requirements by adjusting shifts, adding skilled personnel, equipment, spares, and repair parts to increase the flow of repaired or manufactured material to the using activity or for serviceable storage.

Sustainability – The attributes and status of a system and its supporting logistics infrastructure that enable an operational system to "maintain" its mission capability during the course of military operations. Sustainability is commonly used in conjunction with the term "readiness." Sustainability is influenced by inherent design characteristics, age, and support infrastructure (manpower, training, spares provisioning, technical data, etc.). A system may be ready to begin operations, but may not be able to sustain operations (e.g., maintain sortie generation rates) required by war plans.

Sustained Maintenance Planning (SMP) – A process that encompasses continual review of established maintenance plans to ensure the most cost effective, safe maintenance is being performed on in-service support systems. System age, changes in material conditions, failure modes, and the operational environment are continually analyzed to ensure that safe, affordable, readiness is maintained. Emphasis is placed on use of Reliability-Centered Maintenance (RCM) as a continual life cycle process to establish and adjust preventive maintenance requirements. (3)

Systems Engineering – A process used to translate operational needs and/or requirements into a system solution that includes the design, manufacturing, test and evaluation, and support processes and products. The systems engineering process shall establish a proper balance between performance (including supportability), risk, cost, and schedule, employing a top-down iterative process of requirements analyses, functional analyses and allocation, design synthesis and verification, and systems analysis and control. (3)

Team – A group of people organized for a particular purpose. (See Customer-supplier Partnership.)

Technology Insertion – The concept of implementing changes throughout the life cycle that takes advantage of technology development and maturation to improve performance and avoid obsolescence.

Third party Logistics – Any or all of the logistics support elements for an item or system provided by an entity other than the OEM and/or the user/owner. (1)

Total Cost - The four primary O&S cost drivers are manpower, inventory, technical data, and infrastructure. Because the resources dedicated to these four costs are spread across several activities and numerous funding lines, any analysis of cost drivers must be conducted from a total O&S cost standpoint. Otherwise, the tendency is to sub-optimize the specific funding line or budget activity being evaluated to the detriment of a program or Naval aviation as a whole.

Total Ownership Cost (TOC) – The sum of all financial resources necessary to organize, equip, and sustain military forces sufficient to meet national goals in compliance with all laws, all policies applicable to DoD, all standards in effect for readiness, safety, and quality of life, and all other official measures of performance for DoD and its Components. It is comprised of costs to research, develop, acquire, own, operate and dispose of weapon and support systems, other equipment and real property, the costs to recruit, retain, separate, and otherwise support military and civilian personnel, and all other costs of business operations of the DoD.

(See Section IV – Acquisition Reform Tools and Techniques, Part 5. Total Ownership Cost for a

more detailed explanation.)

Total System Performance Responsibility (TSPR) – A means to divest the Government program offices from system integration responsibilities. Simultaneously, its implementation provides industry not only increased latitude in the design process for implementing system level solutions aimed at long-term sustainment, but also provides clear accountability in design (CAID). Under TSPR, the Government continues to control system functional requirements while industry controls design/product requirements. Thus, the contractor is fully responsible for the integration of all systems, subsystems, components; government-furnished property (GFP), contractor-furnished equipment (CFE), and support equipment and must ensure no performance degradation after integration. Expected benefits from including TSPR as an element of the acquisition strategy include decreased product to user time, reduced costs and data, reduced SPO manpower, fewer engineering change orders/proposals (ECOs/ECPs), and increased product quality.

Trigger-based Asset Management (TBAM) – TBAM is a proactive approach to assess fielded systems trends and re-examine the support structure when "triggers" (such as a change in reliability or maintainability, change in technology, or diminishing resources) are detected. These triggers enable integrated product teams (IPT) to take appropriate action before a support issue becomes critical. (3)

Up-front Investment – DoD5000.2-R requires program managers to consider up-front investments in order to reduce O&S costs. Sometimes more money spent early in the program (up-front) will yield significantly greater savings downstream. Hence, prudent investments should be seriously considered.

Velocity Management (VM) – An initiative to re-engineer the U.S. Army's logistics processes by improving flow (speed and accuracy) of materials and information through the logistics system, substituting velocity (reduced cycle times) for mass (large inventories), and continuously improving value-added activities and eliminating non-value added activities. (See Lean Logistics.)

Virtual Prime Vendor (VPV) – Established by DLA to service depot maintenance facilities and/or weapon system programs with parts in sync with the customers' requirements. Total supply support for a weapon system or maintenance facility. Serves as an extension of DLA and provides on-demand logistical support. Can be a prime for a weapon system or a third party single source for supply support. (6) (See Prime Vendor and Prime Vendor Support.)

Workload – An amount of maintenance work usually specified in direct labor or man-days. It relates to specific weapon systems, equipment components, or programs and to specific services, facilities, and commodities. Workload is converted to dollars when a particular activity is being considered for outsourcing.

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APPENDIX C

ACRONYMS

2LM	Two-level Maintenance
3LM	Three-level Maintenance
AIA	Aerospace Industries Association
ABC	Activity-based Costing
AFETS	Air Force Engineering Technical Services
AFIT	Air Force Institute of Technology
ALB	Aviation Logistics Board
APICS	American Production and Inventory Control Society
APU	Auxiliary Power Unit
ATA	Air Transport Association of America
BCA	Business Case Analysis
BRAC	Base Realignment and Closure
BTP	Built-to-Print
BV	Best Value
CAID	Clear Accountability in Design
CAIV	Cost as an Independent Variable
CALS	Continuous Acquisition & Life-Cycle Support (current)
CALS	Computer-aided Acquisition and Logistics Support (forme
CETS	Contractor Engineering Technical Services
CFE	Contractor Furnished Equipment
CFM	Contractor Furnished Material
CFSR	Contractor Field Service Representatives
CFT	or Contractor Field Teams
CLS	Contractor Logistics Support
CMSR	Contractor Maintenance Services Representatives
CNATRA	Chief of Naval Air Training
COSSI	Commercial Operations and Support Savings Initiative
COCO	Contractor-Owned, Contractor-Operated
COTS	Commercial Off-the-Shelf
CPFH	Cost-per-Flying (or Operating)-Hour
CREP	Contract Repair Enhancement Program
CS	Contractor Support
DCAA	Defense Contract Audit Agency
DCMC	Defense Contract Management Command
DMS	Diminishing Manufacturing Sources
DoD	Department of Defense
DPEM	Contract Depot Purchased Equipment Maintenance

DREP	Depot Repair Enhancement Program
DSAC	Defense Systems Affordability Council
DSMC	Defense Systems Management College
DVD	Direct Vendor Delivery
DVD-R	Direct Vendor Delivery (Reparables)
DVD+	Direct Vendor Delivery-Plus (same as DVD-R)
EC	Electronic Commerce
ECO	Engineering Change Order
ECP	Engineering Change Proposal
EDI	Electronic Data Interchange
ELI	Executive Logistics Information
ELL	Enterprise Linked Logistics
ERP	Enterprise Resources Planning
ETS	Engineering Technical Services
FAA	Federal Aviation Administration
FAR	Federal Acquisition Regulation (DoD, OMB, GSA, ASA, OFP
FAR	Federal Aviation Regulation (FAA)
FST	Fleet Support Team
FMECA	Failure Modes Effects and Criticality Analysis
F3I	Form-Fit-Function-Interface
FS	Flexible Sustainment
GCCS	Global Command and Control System
GCSS	Global Combat Support System
GFP	Government Furnished Property
GOCO	Government-owned, Contractor-operated
GOOP	Going Out-of-Production
GSA	General Services Administration
ICP	Inventory Control Point
ICS	Interim Contractor Support
IIRP	Improved Item Replacement Program
ILS	Integrated Logistics Support
IPD	Integrated Product Development
IPMT	Integrated Product (or Process) Management Team
IPT	Integrated Product (or Process) Team
ISP	Integrated Support Plan
IWSM	Integrated Weapon System Management
JALB	Joint Aeronautical Logistics Board
JIT	Just-in-Time
JLC	Joint Logistics Commanders
JLCG	Joint Logistics Commanders Group
JTAV	Joint Total Asset Visibility
LARS	Logistics Assistance Representatives
LETS	Logistics Engineering Technical Services

LCC	Life-cycle Cost or Costing
LCCS	Life-cycle Contractor Support
LCCS	Life-cycle Customer Support
LCL	Life-cycle Logistics
LCS	Life-cycle Support
LECP	Logistics Engineering Change Proposal
LMI	Logistics Management Institute
LOCO	Locally-owned, Contractor operated
LOGCAP	Logistics Civil Augmentation Program
LORA	Level of Repair Analysis
LSA	Logistics Support Analysis
LSAR	Logistics Support Analysis Record
MP	Maintenance Planning
MRP	Material Requirements Planning
MRPII	Closed-loop Material Resource Planning
MSM	Material Support Management
MTBD	Mean-Time-Between Demand
MTBF	Mean-Time-Between Failure
MTBR	Mean-Time-Between Repair
MTBUR	Mean-Time-Between Unscheduled Removal
MTTR	Mean-Time-to-Repair
MTS	Modernization through Spares
NAS	National Airspace System (FAA)
NAS	Naval Air Station (USN)
NDI	Non-developmental Item
NETS	Navy Engineering Technical Services
NASA	National Aeronautics and Space Administration
NGS	Non-Governmental Standards
NTSB	National Transportation Safety Board
OEM	Original Equipment Manufacturer
OFPP	Office of Federal Procurement Policy
OMB	Office of Management and Budget
O to D	Organization to Depot
O to OEM	Organization to Original Equipment Manufacturer
O&S	Operations and Support
OOPS	Out-of-Production Support
PAT	Process Action Team
PBBE	Performance-Based Business Environment
PBC	Performance-based Contract or Contracting
PBH	Power-by-the-Hour TM (Trade Mark by Rolls Royce)
PBL	Performance-based Logistics
PBTH	Power-by-the-Hour TM (Trade Mark by Rolls Royce)
PIP	Privatization-in-Place

P.L.	Public Law
POS	Pre-operational Support
PPFH	Price-per-Flying (or Operating) Hour
PPS	Post-production Support
PV	Prime Vendor
PVS	Prime Vendor Support
PWS	Performance-based Work Statement or Performance Work Sta
RBL	Reliability-Based Logistics
RLA	Repair Level Analysis
RCM	Reliability-Centered Maintenance
SAE	Society of Automotive Engineers
SMP	Sustained Maintenance Planning
SPI	Single Process Initiative
SPO	System Program Office
TAV	Total Asset Visibility
TBAM	Trigger-Based Asset Management
TCO	Total Cost of Ownership
TDP	Technical Data Package
TCT	Total Contract Training
TLCM	Total Life Cycle Management
TLCS	Total Life Cycle Support
TLS	Total Logistics Support
TOC	Total Ownership Cost
TOC EG	Total Ownership Cost Executive Group
TSPR	Total System Performance Responsibility
U.S.C.	United States Code
VM	Velocity Management
VPV	Virtual Prime Vendor

APPENDIX D

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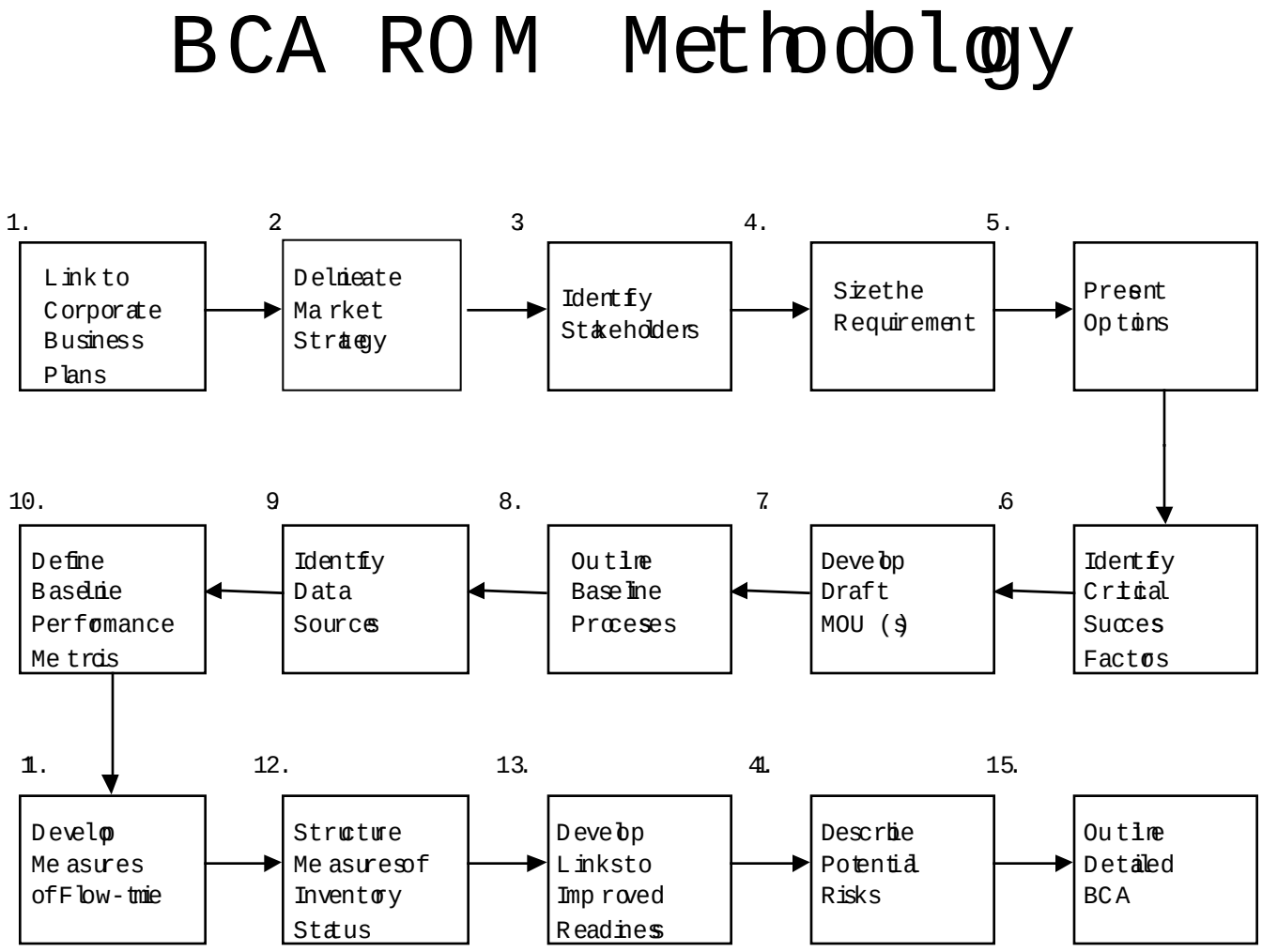
APPENDIX E

BUSINESS CASE ANALYSIS METHODOLOGY

The ROM BCA methodology is comprised of fifteen steps, which establish the roadmap for the specific application. Each concept application area will entail the systematic development of a ROM BCA in accordance with these steps.



Step 1. Link to Corporate Business Plans

This initial step lays the foundation for the military service(s) corporate support for the commercial application and the establishment of a formal partnership. Corporate, command and organizational strategic plans and business goals and objectives will be reviewed and specific links to the commercial application will be developed.

Step 2. Delineate Market Strategy

Commercial aviation support is a strategy for better meeting DoD's weapon system end user's requirements. In this step the viability of industry support for the application area will be discussed along with the potential benefits of this market strategy for both the weapon system program and the end user's (i.e. customers). In addition, the specific scope of the application along with specific objectives will be defined.

Step 3. Identify Stakeholders

The range of commands, organizations and functions impacted (both as a function that provided support and as a customer of that support) by a specific commercial application will be identified in this step. This will include the service and defense agency support organizations, weapon system program offices and the operational commands, organizations and sites. The location of all sites impacted will be specified. The unique, if any, perspective of all stakeholders will be presented and discussed as it relates to the specific commercial application.

Step 4. Size the Requirement

The magnitude of the business requirement is assessed in Step 4. This assessment begins with a specification of the weapon systems supported and the customer sites for the support of that (those) system(s) worldwide. In addition, to identifying the nature and quantity of the systems supported, any specific surge requirements associated with the system will be discussed. The specific requirements for the areas targeted for commercial support will be defined in terms of the past requirements for all targeted levels of support. Special attention will be focused on any trends associated with the aging aircraft and issues, such as corrosion and diminishing manufacturing sources. To the degree that a repair BOM for the targeted system is available, it will be assessed at this step.

Step 5. Present Options

The types of options presented for each commercial application may vary to some degree, but all ROM BCAs will include the definition of the "status quo" option with continuation of current business practices and the "status quo" option with planned business improvements projected to the outyears. In addition, various alternatives regarding the scope and nature of the commercial support will also be presented during this step. These options can include various types of commercial applications, such as a partial application with only select support functions. Other options presented may include variations in how the current operation is transitioned to commercial application with some options focusing on a "phased-in" approach taking several years to complete and others focusing on the "Band-Aid" or "turn-key" approach with the transition occurring quickly.

Step 6. Identify Critical Success Factors

A clear specification of factors critical to the success of the commercial application will be developed during step 6. The factors will be defined along the lines of seven general

categories, but will be tailored with specific program and site objectives. The general categories are (1) Support to military customers with specific metrics for quality, responsiveness and cost reduction; (2) Weapon system readiness with a specific link from improved product support to increased weapon system readiness; (3) Partnerships with a full-fledged three-way partnership including the weapon system program offices, the operating commands and the industry partner; (4) Smooth transition including plans and metrics that minimize disruption and ensure transparency to the end customers; (5) Risk management which includes specific mechanisms and responsible parties; (6) Infrastructure reduction which includes facilities, personnel and equipment at all levels of support; (7) Cost avoidance/savings, which provides metrics for specific percentage or dollar value cost reductions.

Step 7. Develop Draft Memorandums of Understanding (MOUs)

The links to corporate goals and objectives, the market strategy, stakeholders and critical success factor steps provide the information necessary for the development of draft memorandums of understanding (MOUs) between the weapon system program office and its customer base for the particular commercial application. The draft MOU will include the guiding principles of the commercial application based upon the respective corporate goals of each participant. The MOU will also clearly delineate all the specific premises or assumptions regarding the commercial application which form the foundation of the agreement. In addition to clearly specifying the roles and responsibilities of each participant, the MOU will also define specific incentives and sanctions for each participant as it relates to their expected performance levels.

Step 8. Outline Baseline Processes

The generic baseline processes (as is) for the provision of the weapon system support targeted for commercial application is the basis for this step. The processes may include maintenance planning, financial, budgeting, staffing, procurement, material management, distribution and warehousing, DCMC/DCAA oversight, and maintenance operations at all levels. The specific commercial application will entail the tailoring of these generic baseline processes to the specific targeted support application. In outlining the baseline processes for the targeted application areas, it is also important to consider potential expansion of the support application based upon potential benefits to current DoD support business processes and organizations.

Step 9. Identify Data Sources

DoD has numerous sources of data, which may serve as the foundation for the BCA data on the support application area. A standard data file profile for the targeted support application area can be developed with includes items such as depot production systems and weapon system readiness and cost systems.

Step 10. Define Baseline Performance Metrics

Specific baseline performance metrics will be defined during this step to include both “as is” measures and “best practice” indicators. In other words, the existing performance metrics for DoD support organization and operating command customer organizations will be identified along with methods for assessing current performance levels. In addition, applicable “best practice” performance indicators for similar support functions in commercial aviation will be defined along with methods for assessing baseline performance utilizing such metrics. Weapon system readiness metrics will also be identified during this step as they relate to improved product support at all levels.

Step 11. Develop Measures of Flow-time

The nature and structure of current business processes within DoD and the services often leads to lengthy, time-consuming product support activities. In order to improve the responsiveness of product support, valid measures of existing flow-times are necessary. These measures will include developing metrics and identifying data sources to measure support activity flow-times such as: administrative lead-time, procurement lead-time, and order-ship time for material support. In addition, measures of customer (service) repair cycle times, work-in-process and time spent "awaiting parts," also need to be defined and baseline activities assessed.

Step 12. Structure Measures of Inventory Status

A major cost driver in supply management is the cost associated with inventories including the ability to effectively manage technological obsolescence. During this step specific metrics of inventory status for the targeted support application areas will be defined along with methods for measuring inventory performance levels for the baseline.

Step 13. Develop Links to Improved Readiness

The ultimate goal of the commercial application is improved weapon system readiness. For example, if TAT for programmed level depot maintenance (PDMs or SDLMs) is improved due to commercial applications, then the readiness level is improved through increased system availability. Specific metrics will be defined that will logically link improvements in product support at both depot and field sites to improved system readiness.

Step 14. Describe Potential Risks

All initiatives directed at change tend to have some potential risks, some easier to avoid or manage than others. In this step, all potential risks for the specific commercial application will be delineated and avoidance or management mechanisms defined. Potential risks can include Congressional or policy impediments, the difficulty associated with establishing and implementing effective contracting mechanisms, confounding factors associated with the customer site (such as transition to another location) or risks associated with transitioning from the current business practices.

Step 15. Outline Detailed Business Case Analysis

The final step of the ROM BCA becomes the foundation for proceeding forward with the detailed business case analysis based upon management approval. The outline for the detailed BCA will be categorized along the nine general areas listed below with sub-categories specifically tailored for the specific commercial application area:

(1) Baseline business process flows with organizations and staffing identified.
(2) Development of baseline costs which detail the impact to existing operations.
(3) Delineation of current pricing.
(4) Analysis of cost/pricing differences.
(5) Assessment of baseline processes using metrics identified in ROM BCA (both current metrics and "best practice" indicators).
(6) Development of "to be" DoD processes and costs.
(7) Identification of DoD restructuring actions and associated costs.
(8) Evaluation of alternatives (options defined in ROM BCA).
(9) Development of recommended alternative and plan of action.

Phase II - The Delineation of Cost and Performance Baselines for the Targeted Area – The Detailed Business Case Analysis

Step 1. Identify Baseline Business Process Flows

In this first step, the functional processes associated with the existing DoD support activities targeted for the commercial application are identified and delineated. Then, the current organizations and staffing is overlaid on these baseline processes to illustrate all activities, which would be impacted by this proposed application.

Step 2. Development of Baseline Costs

The next step involves assessing the impact of removing those elements of each organization's business base that would no longer exist under the commercial application. More specifically, the costs that were allocated to this targeted business base would be delineated in terms of each organization's specific cost allocation categories.

Step 3. Delineation of Current Pricing

In many DoD organizations, the cost of aviation support is reflected in working capital fund sales or stabilized prices. Thus, in this step, the actual prices for the current DoD products and services that would be provided through the commercial application would be delineated in terms of each current customer base.

Step 4. Analysis of Cost/Pricing Differences

The nature of working capital fund prices often leads to differences between DoD's activity costs and the prices charged for the aviation support services. This step would include an assessment of the scope and nature of any potential differences between the costs and prices.

Step 5. Assessment of Baseline Processes

In the ROM BCA various performance metrics related to the targeted support areas were identified. In this step, these metrics are applied to the baseline processes and costs described in the prior steps. Both current performance metrics and "best practice" performance indicators will be applied.

Step 6. Development of "to be" DoD Processes and Projected Costs

The potential benefits of the proposed commercial application are described as they relate to the DoD processes and costs in Step 6. Various elements of the support processes can be benchmarked to the best commercial practices to assess the potential improvements to supporting the DoD end customers.

Step 7. Identification of DoD Restructuring Actions and Associated Costs

The DoD activities currently providing the support targeted for the commercial application will need to identify and price the cost associated with restructuring their operations to fully realize the benefits of the commercial support. This will also include a proposed transition plan for re-aligning their operations.

Step 8. Evaluation of Alternatives

In this step, various alternative commercial implementations are assessed. This may include various types of support and/or various transition options. The nature of these alternatives would be derived, in part, by the re-alignment and transition plans proposed by the DoD organizations impacted by the proposed commercial application.

Step 9. Development of Recommended Alternative and Plan of Action

Based upon the evaluation of various options and the potential technical, financial and schedule risks associated with each one, a series of recommendations are developed in this step that provide a weighted assessment of each potential approach. The BCA also recommends a preferred alternative based upon clearly delineated assumptions and risks. Then, based upon the preferred alternative a plan of action, which delineates the next steps, is prepared.

Step 10. Develop Alpha Acquisition Plan

In this final step of Phase II, a plan for an alpha acquisition for the proposed commercial application is developed. It is essential that all organizations impacted by the application be represented in the alpha acquisition process. An important element of this plan will be the transition challenges and concerns expressed by all DoD organizations, the service providers and customers.

APPENDIX F

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The members of the working group wish to express appreciation to the members of the Joint Aviation Logistics Board for the opportunity to address the issues set forth in the group's charter. The working group also very much appreciates the time and effort devoted to this project by those who briefed the group throughout the course of its deliberations. Finally, the working group wishes to make note of the beneficial effect of this effort in regard to improved communications and understanding among the government participants and between these individuals and the industry participants. While the group seeks and looks forward to complete adoption and implementation of its recommendations, the working group deliberations have already born very positive results in regard to common understanding and consensus on key issues and terminology associated with defense reliance on commercial aviation support.

The Department of Defense and the Military Departments encourage and facilitate the development of innovative partnerships between DoD customers of logistics support, the internal DoD providers of support, and commercial providers. These partnerships should leverage the core competencies of each partner and clearly reflect specific roles and responsibilities of each partner in meeting specific logistics performance metrics.

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